

THE LARGEST MODEL HOBBY MAGAZINE IN THE WORLD

U.S. ONE DOLLAR / U.K. 60p JUNE 1974

AMERICAN aircraft modeler

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ACADEMY OF MODEL AERONAUTICS





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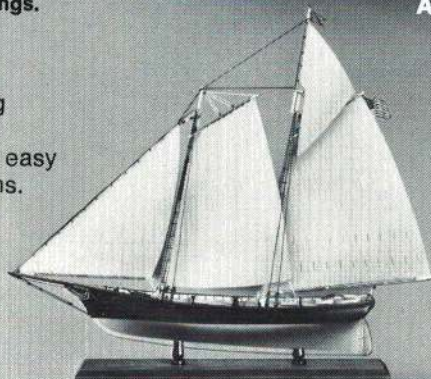
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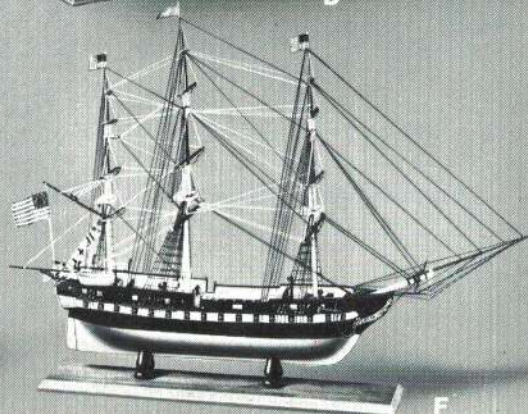
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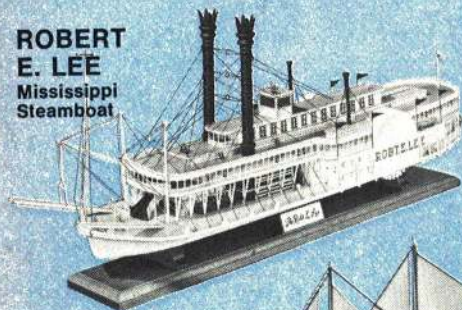
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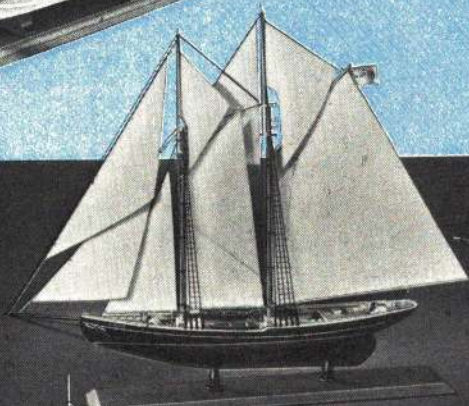
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G. Kit 171, **Sea Witch**, length 27", Clipper Ship, **\$24.95**

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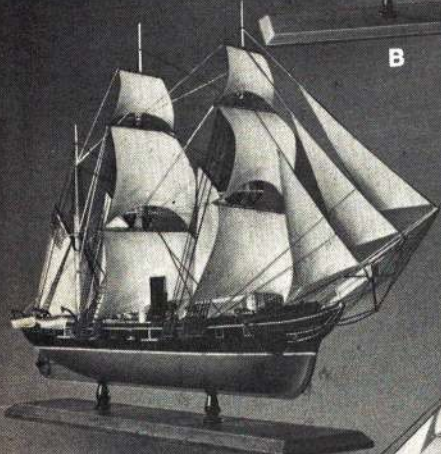
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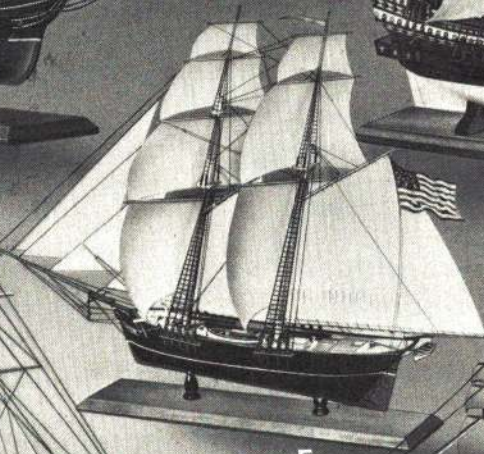
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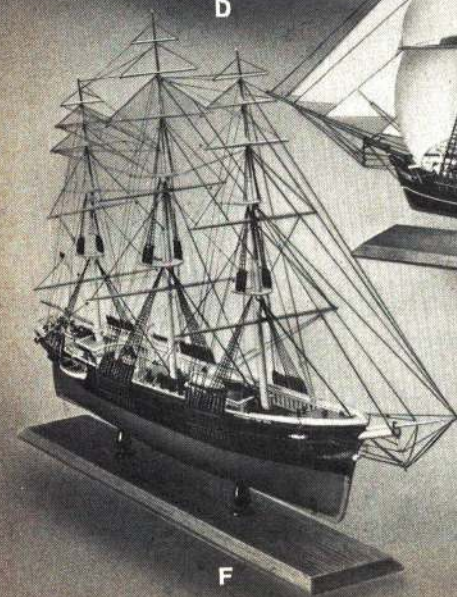
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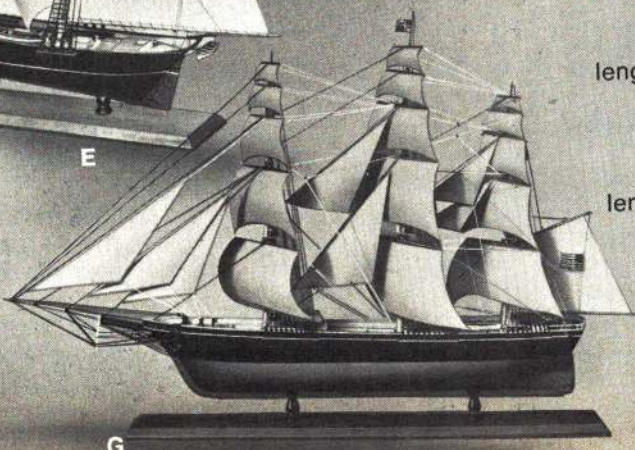
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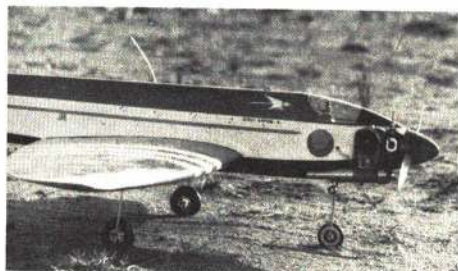
AMERICAN aircraft modeler

VOLUME 78, NUMBER 6

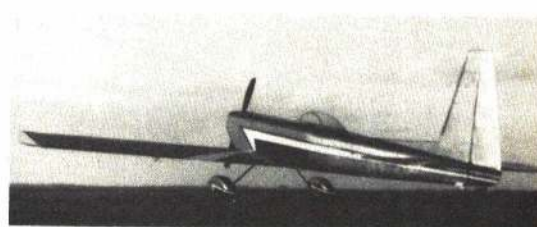
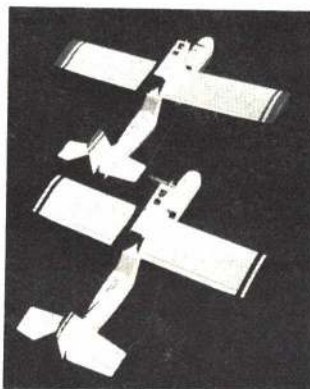
JUNE 1974

COVER PHOTO

Miss Marianne Luplau Christensen finds a warm spot to escape the -46° Greenland temperatures she contends with as a student pilot. The story is part of this month's Editorial, page 4.



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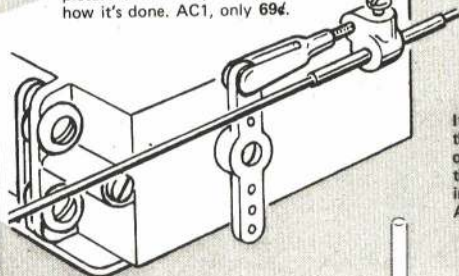


CARL GOLDBERG

3 NEW AILERON FITTINGS!

AILERON COUPLER

At last, a simple way to couple conventional aileron pushrods to your servo output arm. Study the picture a moment, and you'll see how it's done. AC1, only 69¢.



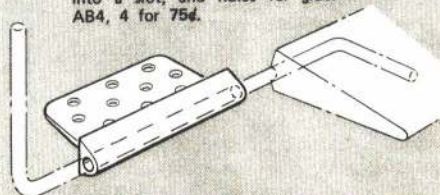
KLETT AILERON PUSHROD EXITS

A beautiful new fairing where the aileron pushrod exits your wing. Roy Klett again has used his special quality touch to produce the finest item of its kind. PEG 3, 2 for 69¢.

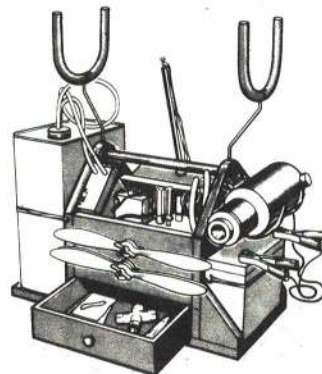


KLETT AILERON HORN BEARING

If you like precision fits, ask to see the Klett horn bearing. Superior to others, it reduces play, and has a thin tapered tab to facilitate entry into a slot, and holes for glue. AB4, 4 for 75¢.



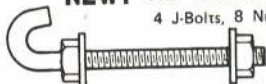
NEW! THE RIGHT-AND-LIGHT FLITE BOX HANDI-TOTE!



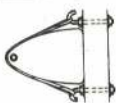
Here's the Flite Box that won't give you a hernia! Compact like you won't believe, yet room for everything you need. HANDI-TOTE was designed by Bob Rich, a practical modeler who flies a lot as he travels around (he's our field representative!). Kwik-Assembly kit HT1, only \$14.95.

NEW! 1 1/4" LONG J-BOLTS

4 J-Bolts, 8 Nuts, 8 Washers
LJB6 59¢



Long J-Bolts are especially useful for holding tanks in place as illustrated here on profile fuselages.



1/2" J-BOLTS.
JB6 4 for 35¢.

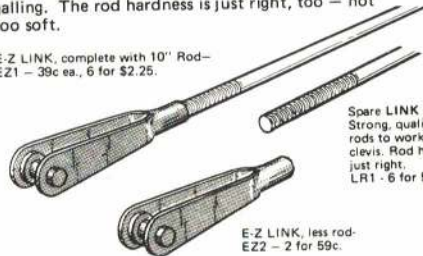
NYLON TAILWHEEL BRACKET



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NEW! Spring Steel E-Z LINKS with 10" Rod 39¢ Each, or 6 for \$2.25. New E-Z LINKS not only save you money, but are made of spring steel and have quality threads that work smoothly without galling. The rod hardness is just right, too — not too soft.

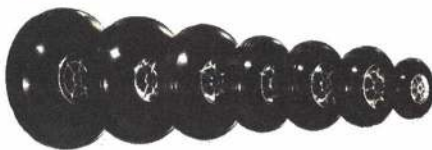
E-Z LINK, complete with 10" Rod—
E21 — 39¢ ea., 6 for \$2.25.



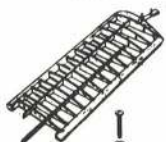
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E-Z LINK, less rod—
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WING KITS For Falcon 56 and Skylark 56. Can be used on either ship. \$9.95
For Sr. Falcon. Easily built, strong. \$18.95
Skylark 62, \$18.95



AILERON BELLCRANK Has steel bushing so crank can be screwed firmly in place without binding. 50¢ for 2 AB1



UNIQUE SNAP LINK! Patented. Tiny 45° shoulder snaps through arm, prevents accidental opening. Snap-Link with rod 29¢. Mini-Snaplink with rod 29¢. Either one, less rod—2 for 40¢.



NYLON STEERING ARM Hardened steel collar and screw. 75¢ SA1



STEERABLE NOSE GEAR Complete Steerable nose gear with nylon bearing, 5/32" plated music wire strut, extra collar, blind nuts, screws and washers. \$2.50 G16N



NYLON BEARING One-piece design, no alignment problems. Includes blind nuts, screws and washers. 75¢ NB1



NEW—MAJOR R/C FITTINGS SETS R/C Fittings Set No. 1 for ship with standard ailerons. \$3.50 RFS1 R/C Fittings Set No. 2 for ship with strip ailerons. \$3.50 RFS2



SHEET METAL SCREWS Like wood screws, but better. Sharp threads, hard. Includes washers—#2x5/16—30¢ for 10. SMS2 #4x3/8—30¢ for 8. SMS4



5/32" ADJUSTABLE AXLE Adjustable axle allows you to easily have the strut length you want. Both the axle and screw are hardened steel. Just file a flat on the strut, and tighten axle in place. 75¢ ea. AA1



ENG. BRACKET for COX "290". 59¢ EB1



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KLETT SAFETY DRIVER Can't slip off and damage your wing! Large for 1/4" Nylon Screws. Small for No. 10 Nylon Screws. 98¢ ea. Large SD1 Small SD2



KLETT PUSHROD EXIT GUIDES To protect fuselage and insure smooth operation of pushrods. Tough nylon. Two sizes—large for 5/64" wire, small for 1/16" wire. PEG-1 Large 4 per pkg. 75¢ PEG-2 Small 4 per pkg. 75¢



CONTROL HORNS Up-right part rises from center of base. Long horns or short, with screws. 50¢ for 2. Long CH1 Short CH2



NYLON REINFORCING TAPE Extremely tough when applied with epoxy. 2 1/2" wide x 5 ft. 50¢. N2 3/4" wide x 5 ft. 25¢. N1



SNAP-R KEEPER Quickest, handiest way to safety pushrod wire end to servo, etc. Easy to use, but has tremendous holding power. Works on wire 3/64" to 5/64" diameter. 4 for 50¢ SK1



4-40 BLIND NUTS—25¢ for 4. BN4



1/2A BELLCRANK and HORN Nylon provides smooth 1/2A control line operation. Easy on dacron lines, too. 25¢ BCH1



1/2A FLYING LINE Dacron Thread—56 ft. Strong, min. stretch. For small control-line models, hinging, etc. 25¢ HL1

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Editorial



THE WIDE WORLD OF MODELING. / Patrick H. Potega

As you read through the pages of this International Issue of AAM, one observation becomes obvious. The world of modeling is unlimited; both geographically and in terms of versatility. A sport with so much variety flourishes in the frozen tundras of Greenland as readily as in the searing deserts of Africa. Helicopters hover in Paris, while seaplanes shoot touch-and-goes off a lake in Canada. The modelers of Turkey discover radio control as, thousands of miles away, a model trade exhibition is held in Germany. Such universality seems to be the pattern of modeling—a fabric of divergent threads.

Our cover photo is an interesting story of such counterpoint. As the photographer, a resident of Greenland, tells it:

Photographed in Sondrestrom, Greenland, the photo depicts some of the widely varied crafts to be found here in Greenland.

The RC sailplane is a Graupner Cumulus 2800, and the attractive young girl is Miss Marianne Luplau Christensen. She is wearing a headband and necklace beadwork, which is typical of the craftsmanship of the Greenlandic Eskimos on the east coast.

The polar bear skin is also from the east coast of Greenland, where the hunting of the ice bears, as they are known locally, is strictly controlled by the government, which limits the hunting to only a small area on the desolate east coast, and then only by native Eskimos.

The carved figures are called "Tupilaks," which are carved by the Eskimos from whale teeth, and which represent mythological spirits that are found in their ancient folklore.

As Greenland is a land of such strange contrasts, the composition of this photo typifies the odd and unusual variety that is found here. The ancient

hobbies of the primitive Eskimo culture of beadwork and carvings contrast with the modern hobby of RC flying.

How dissimilar is this colorful vignette of arctic aviation to the heated tempo of flying in the torrid expanses of Libya. Here is a glimpse at modeling in North Africa, as described by the designer of the Akromaster, which appears in these pages:

The sport of RC airplane building and flying has certainly found a home in the desert camps of the oil companies in Libya. The men assigned to these camps are usually in the desert for six weeks, and in Tripoli or Europe with their families for three weeks, on a rotational basis. Without an interest such as modeling, time in the desert, as these men readily admit, can pass very slowly.

The importance of hobbies, especially RC modeling, to morale has been recognized by the oil companies, and such interests are encouraged. One company, Occidental Petroleum of Libya, has even built a special air-conditioned and well equipped model airplane hobby building, complete with paint room, for their avid RCers. All of you guys who have to drive for miles to a good flying site would eat your heart out to see that beautiful landing strip in the middle of the desert. The main problem is supplies, but somebody is usually going or coming back from home leave. The myriad of special parts somehow make it. If all else fails, these camps have machine shops that can make almost anything—and frequently do.

Bridging Greenland's white frozen tundras and Libya's white sweltering deserts is the common link of model aviation. What other sport or hobby can be so adaptable?

Perhaps this is the key to the success of aeromodeling around the globe. Its versatility offers the type of enjoyment that is common to all men. Our greatest common denominator is sheer fun.

A quick trip to your local hobby shop is almost an international tour, where one can sample merchandise from many foreign lands. The man behind the counter is a veritable Marco Polo, with a treasure of exotic riches. There are engines from Japan, Austria, Germany, Italy and England. One can find baubles and trinkets from places most of us only dream about. It's not farfetched to think that the model you are flying is an international composite. You are part of a universal picture, in a sense—a picture as world-wide in scope as the Internats.

The Internats is, of course, the touchstone, where all the diversity of modeldom meets. In this issue of AAM, John Brink, international competitor, presents his FAI pattern ship. It captures an essence that could only have evolved from his contact with fellow fliers from other nations. Yet it maintains a strong flavor of local influence—

this plane could have only been designed by a modeler from South Africa. And the same is true of Horcicka's outstanding Big Boy IV, winner of the Free Flight Internats. These models are the quintessence of international competition and modeling.

But, there are different levels... what about the similarities between Bowie, Maryland and Vizzola Ticino, Italy? Both places are the site of soaring contests on June 2 (if you can't make either of these, there is also one going on in France that weekend). One soaring buff will be defending his 1973 first place at Vizzola Ticino. He is from Maryland, is now living in Germany, and he'll be competing in Italy. I wonder if his friends in Maryland realize that their flying buddy will, in a sense, be flying with them on June 2.

Also, is it just coincidental that, on June 23, glider wings will soar in Benton Harbor, Michigan, as well as in Lillehammer, Norway? More to the point is the fact that the Lillehammer contest is aptly called "soaring together." Perhaps two fliers, who will never meet, will still be united—riding a thermal together, with only a hemisphere between them.

Still, it is international competition that is the focus of attention. Who could forget the Doylestown Internats, with the raising of all the national flags; and the sign post, which showed the seemingly staggering mileage to the contestants' homes? This was truly the crossroads and hub of modeling for a week. Boundaries were shattered for the sake of flying.

And a similar occurrence will happen again. This time it's at Lakehurst, New Jersey, July 1-7. The AMA will host World Championships in three categories: RC Scale, CL Scale and Indoor. As at Doylestown, the international competitive activities of RC Pylon Racing and Thermal Soaring are scheduled. What better opportunity to express the common language of modeling than at this international gathering. The best modelers will be bringing their world to our doorstep. As with fliers everywhere, they want to meet and share their experiences with all.

So, as you savor the taste of international modeling in these pages, anticipate the full impact of the Lakehurst Aerolympics. The contrasts and similarities will all come together. During the first week in July, the world will be alive with the sounds of modeling. There will be the voices of many nations, all speaking the language of flight.

It is especially fitting that we should host a World Championships at this time, since the Lakehurst Aerolympics will occur during the Golden Anniversary of the first round-the-world flight. It is in the spanning-the-globe spirit that this issue of AAM is presented. . . it is at Lakehurst that this spirit will have life.



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6	3 - 4 - 5	.45	5 1/4	3 - 4	.40	6	7 - 7 1/2 - 8	.75	9	6	.90	5 1/4	3 - 4	.35
7	3 - 4 - 6	.55	6	3 - 4	.45	7	7 1/2 - 8 - 9 1/2 - 10 - 10 1/2	.85	10	6	1.00	6	3 - 4	.40
8	3 1/2 - 5 - 6 - 8	.60	7	4 - 5 - 6	.55	8	7 1/2 - 8 - 8 1/2 - 9	.90	11	6 - 7 - 8	1.10	7	4 - 6	.55
9	4 - 5 - 6 - 7 - 8	.70	8	4 - 5 - 6	.60	9	7 - 12 1/2 - 13 - 13 1/2	.95	12	6	1.20	8	4 - 6	.70
10	3 1/2 - 5 - 6 - 8	.80	9	6 - 8	.70	10	8 - 8 1/2 - 9	1.10	14	6	1.50	9	4 - 6 - 7	.90
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Modeler Mail

Those Belgian Blahs

My landing gear is dragging and my ailerons get mixed up with my landing flaps, and my balsa wood is soggy from the Belgian humidity—what should I do?

K. Rossed Signals
Brussels, Belgium

We had the same problem once. Do any, or all, of the following:

1. Buy a dehumidifier to combat soggy Belgian weather.
2. Extrapolate a 1K pot.
3. Put the pot in your dehumidifier and smoke it.
4. Give up, and eat a Belgian waffle.
5. Read every issue of AAM and Sport Modeler.

—Editor

Thumbs Up

Congratulations on your March '74 issue which is the finest I've ever seen. I say this not only as a WWI nut, but also as a non-contest Sunday flier (of many years inexperience) who looks longingly for plans of "buildable" airplanes. With the possible exception of the Toadstar, every one of your March offerings falls into the "buildable" category. Even the Toadstar might have tempted me if it were a flying boat.

Lorin M. Miller
Bremerton, Wash.

Thanks for the compliment. All our models are "buildable," and they have all been proven as being flyable, too. Having seen some rib-splitting film footage of the Toadstar in action, the thing would work great on floats—so try a Floatstar.

—Editor

What Energy Crisis?

You wanted to know how the energy crisis is affecting people. As far as modeling is concerned, it's not affecting me. I guess I'm lucky. My favorite flying is HLG!

When you find out what's really up, I'd like to know.

Terry Rimert
Cecil Field, Fla.

Chopper Goes to College

I am nineteen years old, enrolled at Cleveland State Community College,

and majoring in Architecture. Would you believe that I am going to get credit in Machine Process II for making the parts for the AAM Superbird (see Dec. AAM)? I managed to get Machine Shop substituted for another course that was required, and also talked the teacher into letting me do the parts for the Conversion.

Tom Chittendem
Cleveland, Tenn.

Pazmany PL-1

In reference to Nick Zirol's Pazmany article in the February issue, I would like to express a few feelings.

First, my father and I know what it is like to unload such a model from a car, and immediately be overrun by questions and onlookers. My father built his Pazmany model in '65 and first flew it in '66, with a G/G Reed set, with tip tanks. Later, he converted this model to house an Orbit four-channel and a set of machined scale shock absorbing landing gear. In this mode, the model has flown ever since (except when shortly retired to pilot Kwik-Flis). This model was scaled from three-views published in the August/September '63 issue of *Air Progress*. First flown with a 60-in. span and powered by an old Fox 40, the model was later adapted to mount a Supertigre 56 and then a Max 58. The model was quite aerobatic, and a beautiful sight in the air.

Secondly, Mr. Zirol's model has a few non-scale points. The front of the canopy has a slight curvature and also the model sports no flying or landing lights of any kind.

Charles Powers
Bridgeport, W. Va.

Mr. Zirol replies below.

In answer to Mr. Powers' comments on the Pazmany PL-1, I can only state that it was scaled from Pazmany drawings and the Karlstrom color plate. I have never seen a picture of a PL-1 with even a slight curve to the canopy. I presume Mr. Powers is referring to the windscreen when he says canopy, since the canopy is obviously curved.

As far as the landing lights go, they are not shown on the color plate, and, therefore, not on the model.

The PL-1 was not built as a scale model, but rather for stand-off events. There are a number of changes that were made to improve the performance, as a model, that are not apparent to the eye. The PL-1 does fly very well, and as Mr. Powers found his version to be "quite aerobatic and a beautiful sight in the air," so I found mine.

Nick Zirol
Smithtown, N.Y.

Congratulations on the April issue of AAM. Sometimes I think we get too serious about model flying. Poking a little fun at ourselves helps to keep a better sense of perspective.

Jack Headley
Palos Verdes Pen., Calif.

papi

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Uplift Revised

The absence of "Uplift" in this issue signals a new approach and concept for that section of AAM. In the past, we have honored clubs' efforts to promote our hobby.

Beginning with the September issue, we will be honoring clubs' efforts, but with that little something extra. Colonel Betkey's Flying Circus will begin the series. Every three months there will be a presentation of the best effort for that period.

At the end of each calendar year, we will make a judgment on the four clubs highlighted, and determine the AAM Club-of-the-Year, based on their PR efforts. The September and December 1974 "Uplift" articles will be included in the 1975 calendar year.

In the next issue of AAM we will outline the suggested guidelines for the story. Of course, no effort is fully recognized until the Club-of-the-Year is presented to its peers. The club so honored will be featured in AAM. In addition, the club will receive a plaque, and a check to be used in whatever manner the club deems correct.

Watch the next issue of AAM for the particulars. It only takes a little more effort to promote our hobby to the general public. Think about it. Address all correspondence to: Joe Wright, Uplift Editor, American Aircraft Modeler, 733 Fifteenth St., NW, Washington, D.C. 20005.



Paul Harvey Views

IF JOHNNY CLEMENS HADN'T...

If with pleasure you are viewing any work a man is doing,

If you like him or you love him, tell him now.

Don't withhold your approbation 'til the parson makes oration

And he lies with snowy lillies o'er his brow.

For no matter how you shout it, he won't really care about it;

He won't know how many teardrops you have shed.

So if you think some praise is due him, now's the time to slip it to him. . .

'Cause he can't read his tombstone when he's dead.

Johnny Clemens, our President, is forked-end down again and we are all delighted.

It was a rough landing but he's back together, the glue joints are camouflaged and his renovated plumbing is more modern than most.

And we are glad.

But if Johnny had not walked away from that crash, we'd be feeling awfully sorry for ourselves about now. This issue and comparable publications would montage photos of Tiny Tex, showing his tireless participation in every activity that benefited our hobby and its related businesses.

There'd be flowery eulogies testifying to his total commitment to our AMA and our USA.

Well, I'm getting tired of carrying in boxes the friends I'd failed to appreciate while it mattered. Respectfully, I'm suggesting a bouquet of flowers for Johnny C. while he can smell 'em.

As a sophomore modeler, I'm disinclined to counsel my elders in this hobby. But, perhaps a high number AMA member, who'd been away from

balsa birds for twenty years, has a better wide-angle view of your hobby's evolution than you who have grown up inside it.

No worthy organization ever took off without a talented, dedicated hand at the controls.

The American Medical Association had Morris Fishbein when it needed him most.

The Airline Pilots Association had Dave Behncke when it could not have survived under lesser leadership.

That our own AMA has grown so fast with minimal growing pain is a considerable tribute to a handful of selfless men, epitomized by Little John, the magnum Derringer.

We've had strong leadership with minimal resentment and have become "big business" without a breath of scandal.

That takes good men.

Do you realize that there is no business, however big, which could afford to buy the talents which volunteer for AMA chores! Look at the guys who organize and administer clubs, contests and self-regulation.

They represent a resource our treasury could not possibly afford—and they give us their time and talents—in the image of the peppery President who has neglected his own business and even his own health to be everywhere, rally everyone, bandage hurt feelings and jolly everybody with his indomitable effervescence.

Johnny is still dreaming big dreams. No bouquet could mean more to him than to see the rest of us put rivets in his biggest dream: a permanent home base for our association and our major contests.

I hope we are as big as he thinks we are.

We see our Mister President now, bouncing about; it's difficult to recall the dark days of last Fall. There were weeks when it looked like the valley of the shadow had a dead-end.

But when he was not in a coma, he was talking, and never about how much it hurt, or how much his personal resources had been depleted, or how much his neglected business had suffered—he talked about *you*! You AMA guys, and your needs and your next project.

God willing, our Association will outlive us all; but none of us will ever be out of debt to the part-time clown, with a whim of iron, who hand-launched us while we were learning.

*More than fame and more than money is a comment kind and sunny,
And the hearty warm approval of a friend.*

It gives to life a savor, makes one stronger, braver;

It gives one heart and spirit to the end.

*So if he earns your praise bestow it. . .
If you like him let him know it. . .*

Let the words of true encouragement be said.

Do not wait 'til life is over and he's underneath the clover,

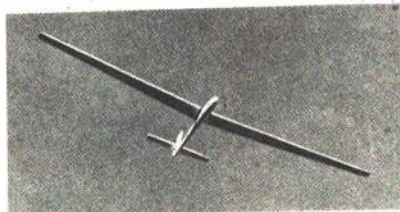
'Cause he can't read his tombstone when he's dead.

COMING IN

JULY AAM



SUNDOWNER Ducted Fan



TERN

ALSO:

Phoney Folkerts (FAI Pylon)
El Tigre (RC Pattern) / Avenger
(CL Stunter) / AAM's Glowdriver
The AAM Weathermaster (Part II)

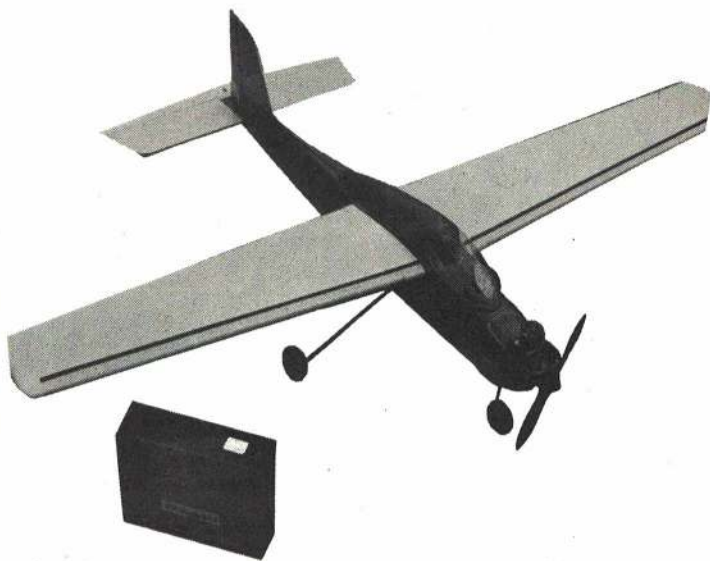
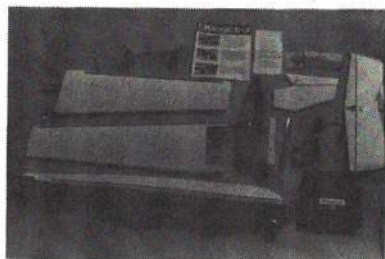
DON'T MISS IT

HOBBY LOBBY's
INTERNATIONAL**COMPLETELY Ready-to-Fly**
3 CHANNEL AIRPLANE ...

Ready Bird 23 \$199⁰⁰

The READY BIRD 23 is an almost fully assembled Lanier airplane with an EK Products "Little Red Brick" 3 Channel digital proportional system FULLY INSTALLED, a Fox 25RC engine INSTALLED, and pushrods, wheels, fuel tank ... EVERYTHING ... FULLY INSTALLED AND ACTUALLY READY FOR YOU TO FLY!!!

Since we couldn't fit the fully assembled plane into a box you must glue the two wing halves together, and glue the tail to the fuselage. But, this only adds up to about 23 MINUTES WORK, gas 'er up, and GO FLY IT!!!



We actually have a problem describing the READY BIRD 23 because THERE HAS NEVER BEEN ANYTHING LIKE IT!! The airplane itself is a new 50" span plastic Lanier plane with a symmetrical airfoil wing that gives steady 3 channel handling characteristics even in wind, but retains enough stability to make the plane ideal for beginners. The READY BIRD 23 is designed for 3 channel operation (rudder, elevator, throttle) and your READY BIRD 23 comes with the excellent EK Products "Little Red Brick" 3 channel digital proportional INSTALLED.



The correct Sullivan fuel tank is INSTALLED, the pushrods to rudder, elevator, throttle and steerable nose wheel are INSTALLED, and the clevises are even pre-fitted to fit the elevator and rudder horns.

What we're trying to say is that READY BIRD 23 is READY TO FLY—it's NOT an ALMOST-ready-to-fly! If you were to take the READY BIRD 23 out to the flying field here are the items you'd need that are NOT included in the kit as you receive it from us: Epoxy glue, can of flow fuel, starting battery and glow plug clip, 9 volt dry cell for transmitter, alkaline cells for receiver, EVERYTHING ELSE IS IN THE BOX!

Aside from the fact that the READY BIRD 23 is an ideal way for a lazy guy to jump right into multi-channel RC flying, there are a couple of other reasons that this totally ready to go plane is ideal for beginners and sport flyers:

1. THE BEGINNER IN THE BOONDOCKS
Maybe you are stuck out in some place as remote as Bentwhistle, Oregon and there is NO ONE who knows anything about RC at all. Well, you can buy all the books about this hobby, but nothing helps as much as a good LOOK at a ready-for-flight RC plane. The READY BIRD 23 is as ready-for-flight as anything you'll ever see.

2. THE BEGINNER IN THE BOONDOCKS—Idea Number 2.

Let's say you've gotten pretty proficient at flying your READY BIRD 23, so the next maneuver you try is to complete a loop a couple of feet below ground level and you splatter your READY BIRD 23. All is not lost!! You buy another airframe only for your READY BIRD 23, or maybe you want to try some entirely different 3 channel type airplane. Since you've seen exactly how to make pushrods, install

equipment, install an engine, and do all the other myriad of things that go into completing a modern RC plane, you are now in a good position to go ahead by yourself with your own RC installation.

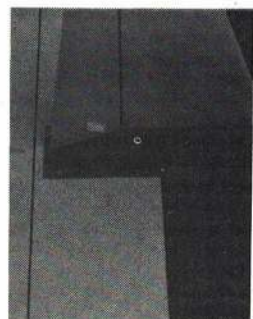
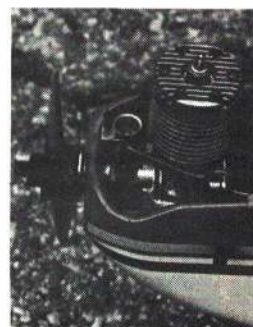
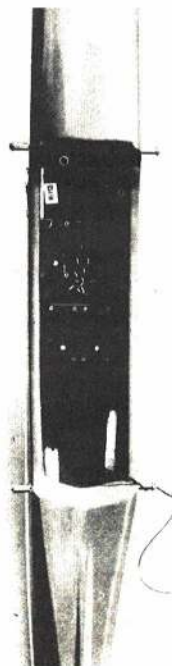
3. THE LAZY BUM PRINCIPLE

You want to fly RC, but nothing quite as simple as the Testors or Mattell single channel planes, but you're just too lazy to build a fancy multi channel ship ... Our READY BIRD 23 is just the thing for you, you lazy bum.

4. THE EXPERIENCED RCer GAMBIT

You are an experienced RCer, so everyone in your town comes to you and tries to get you to do everything for him because "I just don't know as much about this RC hobby as you do." You can now get this pest off your back by telling him that he can spend \$199 and get a COMPLETELY READY-TO-FLY READY BIRD 23 sent to him real quickly by Hobby Lobby.

I think that this READY BIRD 23 will be the greatest boon to the patient and helpful experienced RCers around the country since the digital propo relieved them of the job of tinkering around with everybody's reed outfits.

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READY BIRD 23'S AND HOBBY LOBBY III'S ARE IN STOCK.
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Our **Series III** radio is for the RCer who wants the very best, even if it costs him less!

RC MODELER MAGAZINE SAYS...

"Our Hobby Lobby 5 has performed flawlessly under all conditions and its performance has equalled or exceeded systems selling for twice the price."

● Unsurpassed Reliability

● Extremely Long Range

● Smallest, Lightest Servos Made

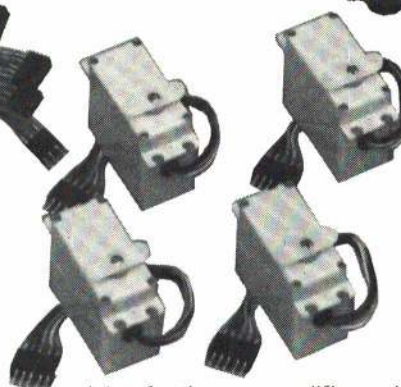
● Extra Servos Cost Only \$13.00 Each

● Improved Airborne Battery Pack with ONE-CELL-OUT Flight Capability

● Only 11½ oz. Airborne Weight

OUR SECRET

The Hobby Lobby 5 has one particular feature that makes it the single **MOST RELIABLE** digital proportional in our experience (and we stock most brands of digitals, so we figure we've got a pretty good basis for comparisons). This feature is that the **SERVO** amplifiers are housed inside the **RECEIVER** in the Hobby Lobby 5, instead of inside the servos themselves. As the servos are the only components (besides the switch) that are tightly fastened to the vibrating airframe they are subject to vibration-induced breakage in every single solder joint. All other brands of radios have as many as 80 solder joints inside **EACH SERVO**. But the servos for the Hobby Lobby 5 have only 8 internal solder joints. The other solder



INNARDS OF A HOBBY LOBBY 5 SERVO

joints for the servo amplifier are inside the more shock-protected receiver.

Knowing of the high reliability of the Hobby Lobby 5 servo system we can't understand why **EVERY** digital proportional doesn't use this obviously better servo amplifier idea, but, as it stands now, the only radio system we know of that uses this sensible system is the Hobby Lobby 5.

P.S. This servo amplifier system has another nice fringe benefit. Since it contains no expensive amplifier, a Hobby Lobby 5 servo only costs you \$13.00.

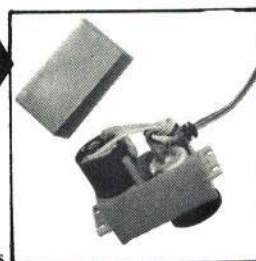
● I. C. FULL-POWER Servo Amplifiers

● Full 90 Day Warranty-Backed By The Manufacturer and By Hobby Lobby

● A Complete System: Transmitter, Receiver, 4 Servos, All n-cads, Charger, 27 or 72 mhz.

● **PRICE:** About Half of What You'd Expect to Pay for a Top Quality 5 Channel System

Series III
HOBBY LOBBY 5
Digital Proportional
\$209



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HOBBY LOBBY ILLUSTRATED
CATALOG \$2.00

MORE goodies, MORE photos, MORE of the **LOWEST DELIVERED** prices in the R/C Hobby!



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Report From Nuremberg

Every year, in Nuremberg, Germany, an international fair is sponsored by a billion dollar industry—the toy makers. / by Walt Good

Imagine a dozen display buildings the size of the Toledo Show, 1500 exhibitors from 36 countries and 25,000 visitors and you have the 25th International Toy Fair in Nuremberg, Germany! And the attendance is open only to legitimate dealers, not to the general public—not even to the enthusiastic hobbyist.

Almost ten percent of this giant one-week fair is devoted to our model hobby of planes, boats and cars. So we spent two and a half days trying to glean the new from the old, and to bring you a report of those items which caught our attention. Attempting not to look at the other ninety percent of the non-model exhibits (covering everything from harmonicas, to chess sets, to next year's Christmas decorations) was almost hopeless, considering the presence of my helping wife, who is interested in many things outside the modeling hobby.

First of all, don't be disturbed by the "Toy Fair" title. Strictly speaking, the fair is labeled the "Spielwarenmesse," which translates into "Play Wares Exhibition" or more simply, "Toy Fair." In any event, it's a billion dollar industry...consequently we heard no derisive remarks about the old saw that "you can tell the men from the boys by the cost of the toys."

HELICOPTERS

Although two new helicopters appeared at the fair, the general trend was toward improvements of existing systems, to promote easier and more precise flying.

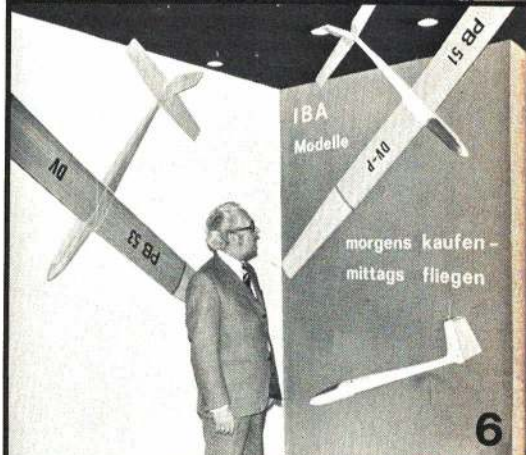
Dieter Schluter, originator of the Hagi Cobra and DS 22, has formed his own company. He has just introduced a new machine, scaled after the French Aerospatiale SA 341 Gazelle. It is similar in size to his previous designs, with a rotor diameter of 62" and uses a Webra 61HC. Also new from Schluter is a collective-pitch rotor, which is coupled to the engine speed control, thus giving rapid and positive vertical control. The new rotor is available separately, and is known by the name of "Expert." It can be added to the Gazelle, Cobra and DS 22 helicopters, to provide the collective-pitch features. Since Schluter is a professional engineer, and a pioneer in the model helicopter field, he brings much experience to his new venture. His wife Heidi is also an enthusiastic partner in the business.

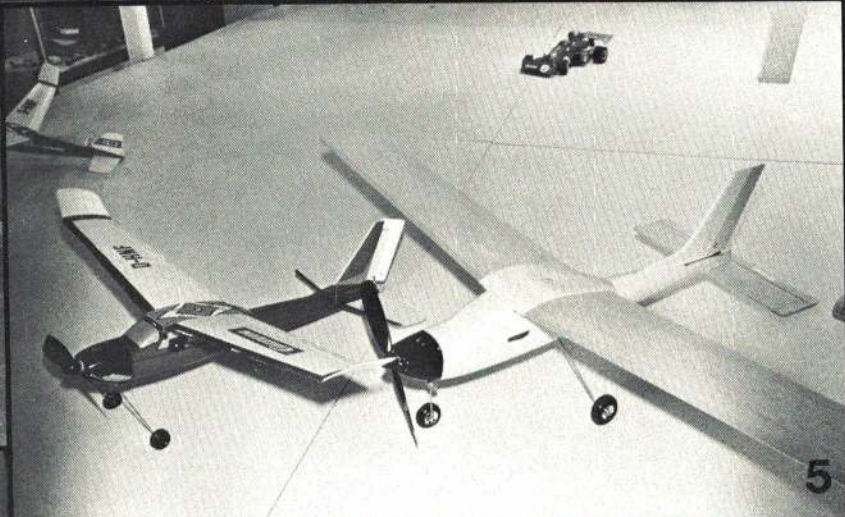
A new helicopter model, patterned after the German-made Bolkow BO-105, was introduced by two well-known German model companies, Rowan and Wik. The size is the same as Schluter's, and uses a 60 engine. The full-scale BO-105 is a familiar sight in Germany, where it is used by the police, and the auto safety company, ADAC. The model uses the Hiller rotor system, and does not have the collective-pitch feature. It is understood that the mechanical aspects of the BO-105 are produced by the Meindl Co., which has provided similar parts for several years to other model helicopters. I was told that the BO-105 is available from Midwest Model Supply in the USA.

To its highly successful Bell 212 Twin Jet Helicopter, the Graupner Co. has introduced two features which are helpful to the beginner learning to fly. One is a rotor shaft extension, which effectively lowers the center of gravity, thus giving the machine more self-stability. The other is a pair of soft plastic floats. The floats not only soften the "landing," but improve the self-stability, due to the effect of the rotor wash on the large float area. These changes also put the rotor blades higher above the ground, and permit larger tipping angles and ground clearance, thus reducing rotor blade damage. Another innovation to help the learners is to collect groups of newly finished machines and their eager pilots to a convenient spot. Graupner personnel make pre-flight inspections, any necessary adjustments, and then assist the new pilot with his initial flights. A good idea! I'm told that the fixed-wing RC pilot may need more flying instruction than the newcomer, since he must "unlearn" some of his previously acquired automatic responses.

Simprop offers a new helicopter rotor for the Bell Jet Ranger. The rotor is the result of considerable theory and experimentation, and permits equally smooth banked turns to the left and the right. Apparently, the earlier rotor favored left turns. As I understand it, the new rotor uses the Hiller system, and control signals are sent through both the stabilizer and the rotor blades. Not being a helicopter pilot (yet), I haven't become "fine-tuned" to all the new terminology. I would like to learn to fly a helicopter, but haven't been

(Continued on page 78)





(1) Leon Janssen admires his Britten-Norman Islander, as produced by Tenco. Ship has seven-foot span, and the kit includes all sorts of extras.

(2) Johannes Graupner with his modified Bell 212. Model has rotor shaft extension and pontoons for training purposes.

(3) Mrs. Heide Schluter displays the "collective" rotor assembly manufactured by her husband, Dieter, under the name Expert.

(4) The Carrera display area included a pool where one could watch a leisurely RC Boat demonstration.

(5) Very similar to the Mattel SuperStar is the Carerra electric rudder-only model, which huddles under the wing of the larger two-channel electric model.

(6) Mr. Bauerman examines his IBA prefabricated gliders. They did well at the Doylestown Internats.

(7) The Wik booth displayed the Super Tiger for the new biplane pattern.

(8) FM radios for the hobby are now legal in Germany.

(9) A general view of the Simprop display area shows the modern decor and functional display areas of the Nuremberg facilities.

(10) The miniaturized Kavan gyroscope, to give yaw-axis stability to 'copters.

(11) Draco gliders, by Carrera, come in three sizes. The most predominant one in the photo sports an electric power pod.

ON THE SCENE

TURKISH MODELERS TAKE TO RC. "Ucalim!"* That's the word in Turkey these days. In this surprisingly air-minded country, RC has become a new national pastime.

by Robert Munn

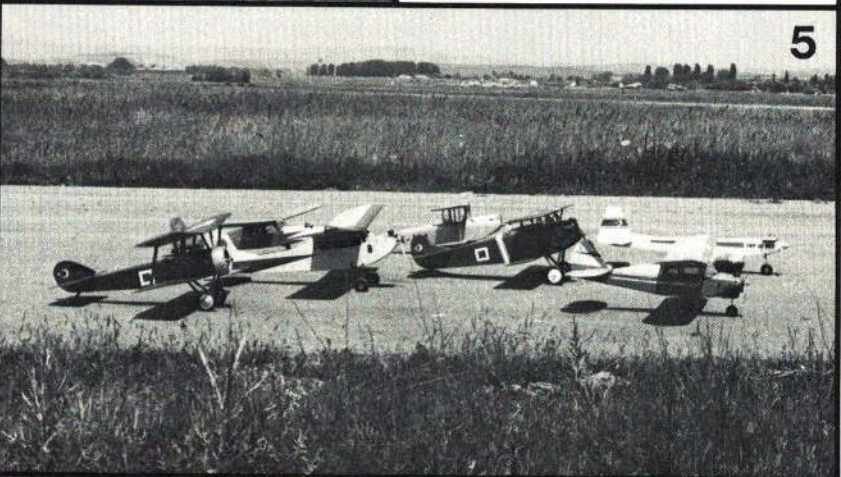
For years, Turkish modelers have been active, both at home and in Europe, on the Wakefield and Nordic competition scene. Despite very high customs duties on imports, some had also flown modest power models. But the annual contests sponsored by the Turk Hava Kurumu, or Turkish Aero League, included only gliders and rubber-powered events. The THK regulates Turkey's civil aviation, including flight training and parachuting.

One of its branches, supported almost entirely by public contributions, is the Model Ucak Okulu (Model Aircraft School), located at an airfield near Etimesgut, outside Ankara. Here, a small group of professional modelers, led by school director Husnu Tekinay, design and kit a series of beginner-type models. Using predominantly local materials to hold down costs, these kits are distributed to participating secondary schools throughout Turkey. Teachers receive instruction in model building and flying at the THK Model Aircraft School, then pass it on to their local students. The THK pros also travel through the country, making demonstration flights to stir interest in aviation careers and advanced technologies.

During the last two years, Air Force Major General Kani Madasoglu, President of the THK, has energetically expanded model programs on all fronts. Under his leadership, THK obtained the government's approval for the operation of radio-controlled model aircraft for experimental and demonstration purposes. General Madasoglu invited Americans experienced in the sport to join with THK in promoting all forms of RC activity. The invitation was eagerly snapped up. Many Americans, fortunate enough to be living in Turkey, had long hesitated to fly RC. Except in some Common Defense areas, there are tight restrictions on all forms of private radio operation in Turkey. Now, THK airfields were available in the official program, and a new partnership of mutual interests blossomed.

(Continued on page 85)

*"Let's go flying!"



1. Competitors and officials at the Ankara RC Jamboree. Author kneels (front row center) holding Turkish flag. Event emphasized fun and information swapping for the large number of new RCers.

2. David Shad, with the assistance of John Fuqua, taxis out a new Ugly Stik for its maiden flight.

3. K.K. Schrader, a USAF visitor from Spain, launches his beautifully finished Windree.

4. A near miss in the Balloon Bursting event. Mehmet Kapancali (Istanbul Model Club) came around again to win the event.

5. IMUK (Istanbul Model Airplane Club) turned to RC in a big way. Here are a few of the fine craft the members have produced.

New 5-channel Champion, \$319.95. This is EK's year.

For years, the Champion from EK-logictrol has been a favorite of the R/C flyer.

Known for its outstanding control accuracy and reliability, the Champion is a recognized leader among medium-priced units.

But this year, the Champion is likely to be even more popular.

It's less expensive than before, while still providing all the fun-packed thrills of a dependable, high-performance unit.

The 1974 Champion features full 5-channel control, dual precision sticks with adjustable tension, throttle right or left and your choice of servos (Mini-Mite, linear or rotary; or Super-Mini, rotary).

Standard on the 1974 Champion is EK's new expanded-scale voltmeter in the transmitter, a light-emitting diode in the battery charger circuit and a two I/C receiver decoder circuit.

The Champion also carries EK's exclusive one-year warranty that's renewable for a second year.

All this for only \$319.95, including transmitter, receiver, battery pack and four servos.

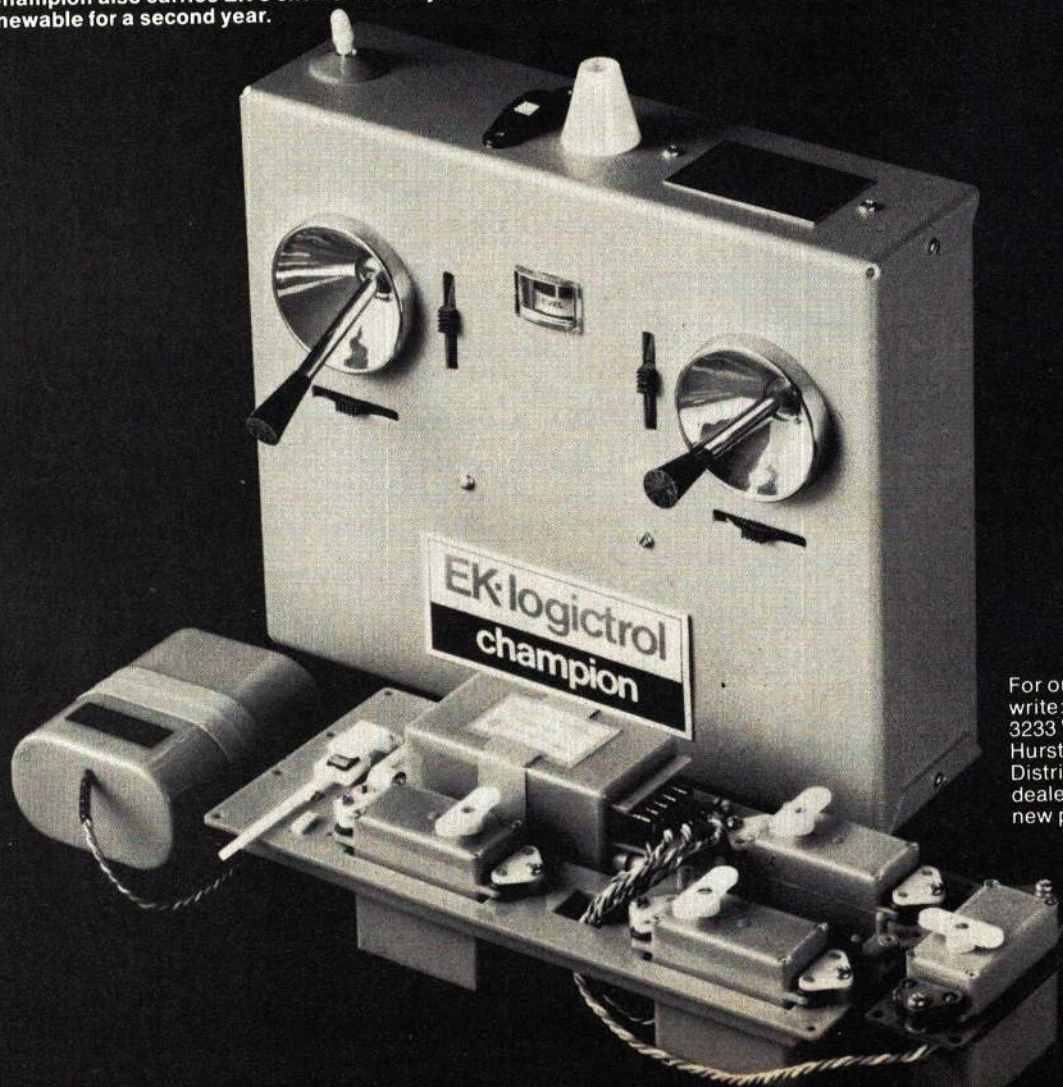
With the 1974 Champion, EK-logictrol is putting improved control, power and flexibility into the hands of the R/C flyer.

It's EK's year. And it could be yours, too.

Take the controlled approach to R/C flying.

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The controlled approach



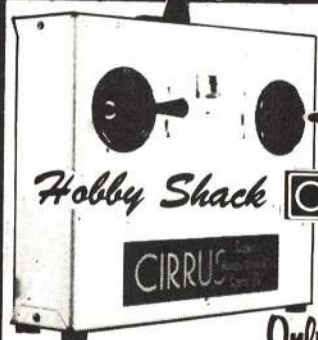
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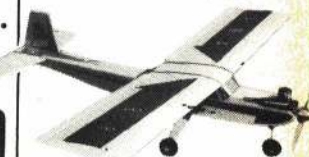
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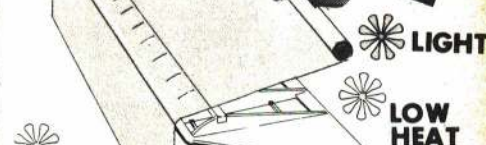


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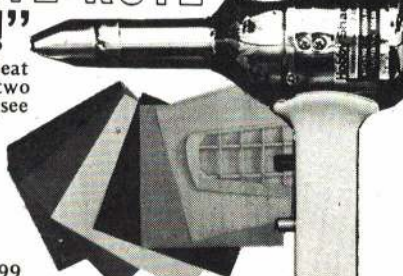
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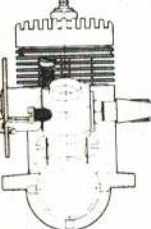
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NOVI

From South Africa, where the art forms are expressed in strikingly elegant lines, comes the Novi Arrow. This internationally renowned FAI pattern bird flies with a gazelle's gracefulness, yet it's a lion in competition.

by John Brink

Successful pattern flying consists of four major elements: the pilot, airplane, radio and the engine. With the Novi Arrow, the airplane element is taken care of—the rest can be bought or developed with practice.

What is so special about the elliptical wing? Does the extra trouble in construction warrant the results? Well—build one, and be convinced it does!

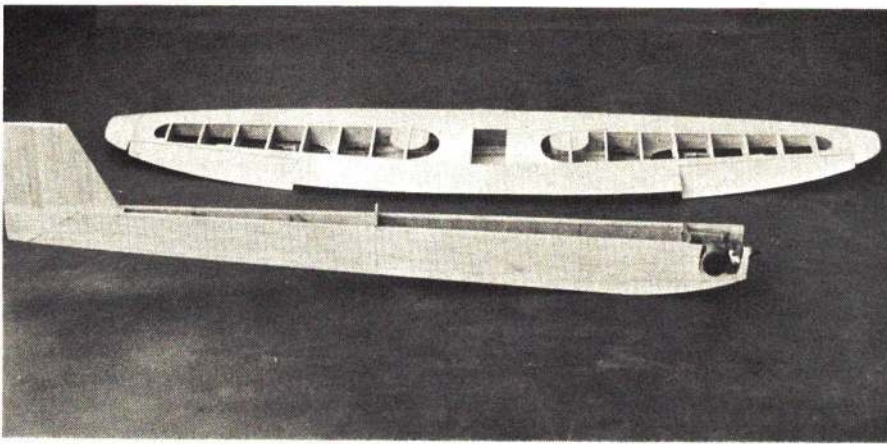
For a start, it looks nice. All men like curves, and this includes those hard-to-please judges. But the elliptical wing has far more going for it than this. Theoretically, it is supposed to represent the ideal planform from a distribution-of-lift point of view; also it is an effective way of packing in maximum wing area within a given span.

This extra area helps to maintain a reasonable wing loading, especially with the additional weight retracts have brought to pattern planes. Most of our flying in South Africa is at altitudes of 6000 ft., in temperatures of 80 to 100°F. . . so keep it light for similar conditions.

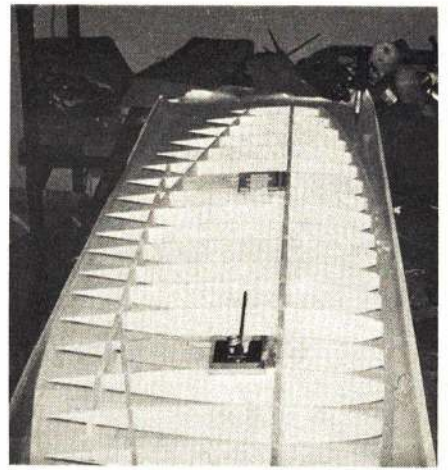


ARROW

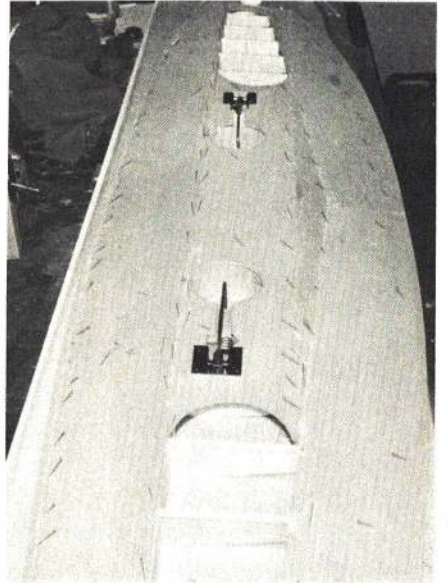
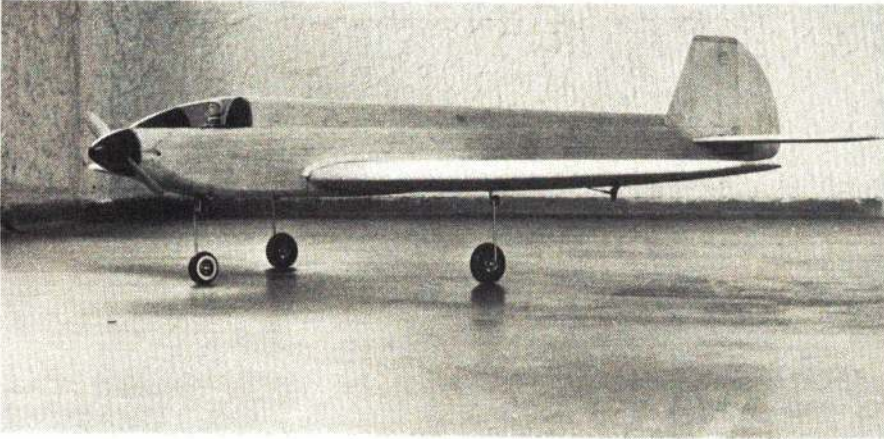




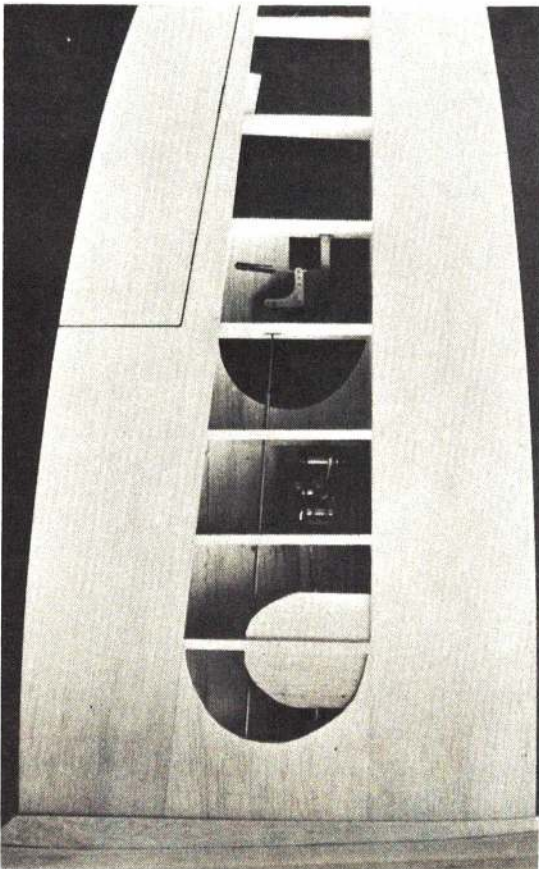
It really doesn't take long to get the construction to this stage. Nor does it take much longer to . . . get it to this stage, ready for covering.



Wing construction is flat on the board. Egg-crate construction keeps things aligned. Retracts should be fitted at this stage.

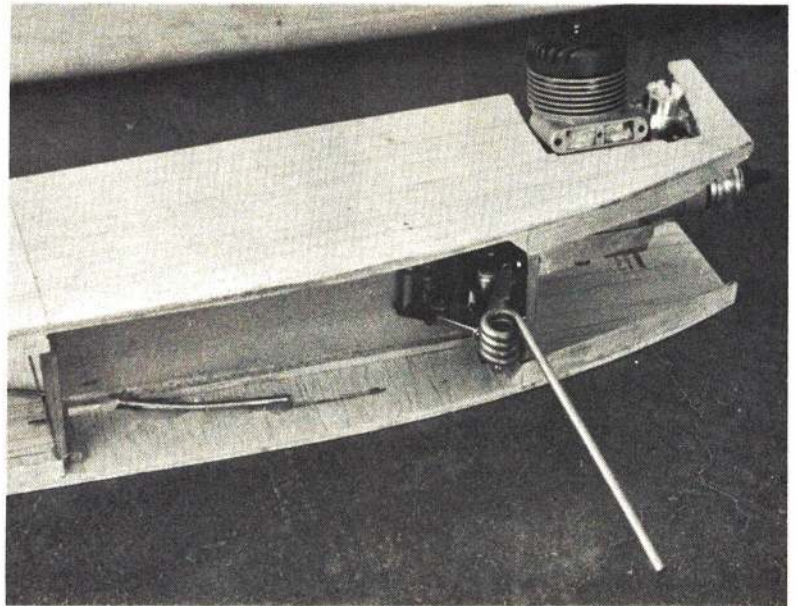


Rob a pin factory prior to applying the wing sheeting.



Detailed shot of the aileron linkage and retracts reveals standard operational procedure.

NOVI ARROW



Fuselage structure is elementary—all straight lines and right angles. The engine area is simple and spacious.

The thin wing tips smooth out flying in turbulent air, without going to excessive weight to achieve the same results. Where this wing really excels is in the rolling maneuvers. The small area at the wing tips means less air resistance when rolling. The low weight towards the tips reduces the inertia of the rolling wing, resulting in precise stops, without overshooting. The forward position of the ailerons on such a wing planform moves the rolling moment nearer to the CG; truer axial rolls are apparent. With the new FAI Pattern, all the high point maneuvers have rolls in them, so the advantages of this wing cannot be overlooked.

This airplane is not a snap rolling demon, but can be dragged in, nose high, at walking pace, without any tendency for a wing to drop. The stall is predictable, and results in the nose dropping cleanly at the entry of the spin. A lot of credit for this must go to the Goettingen 459 airfoil, as it displays similar characteristics on different wings. The 12.75 percent thick airfoil section is maintained throughout the wing and, coupled with the large area, gives an excellent speed range.

The fin and rudder are kept low along the vertical axis to give a pure yaw effect, without rolling tendencies when applying rudder. This enables the stall turns in the Figure M to be completed, even when leaning the wrong way.

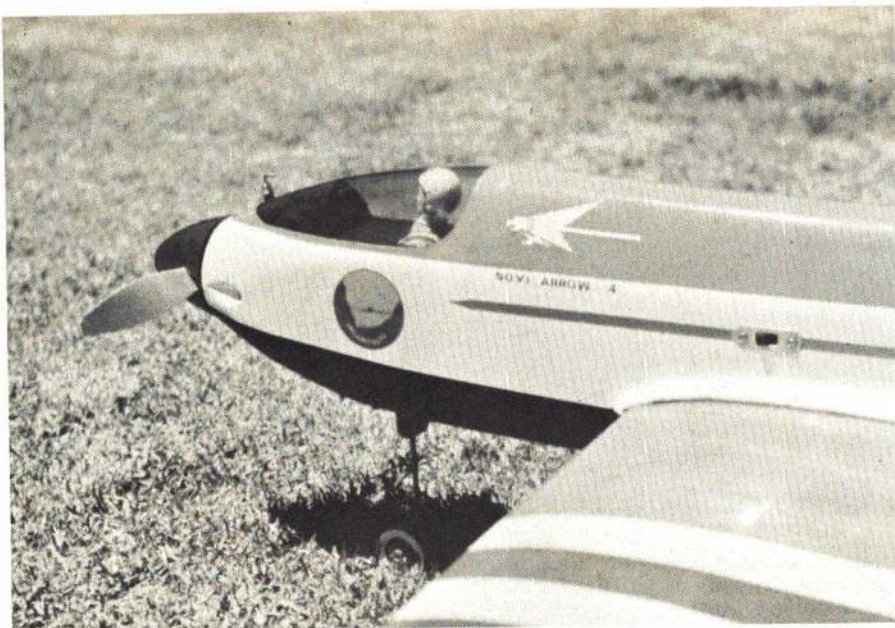
CONSTRUCTION

The one-piece wing is built flat, upside down, so a straight six-ft. long building board is essential. All the sheeting should first be cut to shape, but left slightly oversize, to facilitate precise fitting later on. In order to prevent warps from developing, all sheeting, spars, etc. should be straight, and nothing should be force fitted. Use only the lightest wood, if the whole wing is to be sheeted. Where necessary, curve the sheeting by dampening the outside surface.

The spars are full depth, with the ribs slotted in, egg-crate fashion, until the top of the ribs rest on the building board at their main spar position. When pinning the spars to the building board, cut off the pin heads to ease removal of the wing later. The small figures on each rib pattern, e.g., 22.2, indicate the height in millimeters that the centerline of each rib should be above the building board. This height, for each rib, should be marked on the LE, and the spars should be notched down to this height above the building board. Accurate fore and aft alignment of the ribs is thus ensured.

Before gluing anything, trial fit the ribs to the spars and sight along the TE to check the alignment. In order to obtain a straight hinge line along the top surface of the aileron (remember the wing is upside down) a little washout may be required from rib 9 to 13.

Now glue the ribs to the spars and the pre-formed, laminated LE. When dry, the excess spar material may be trimmed off flush with the bottom of the ribs. Fit the wheel wells and retract



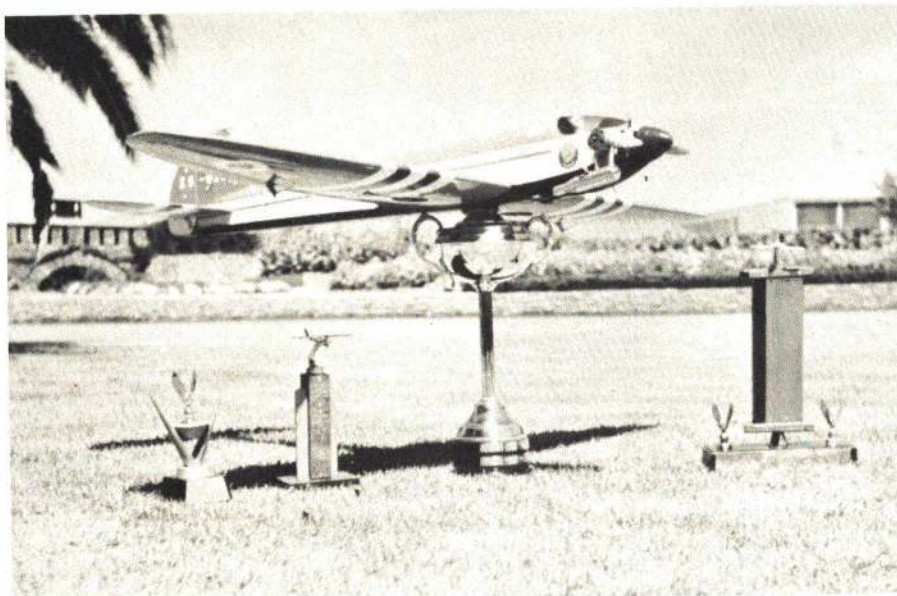
The Novi's proboscis, pointed like an arrow, is in the current FAI style, with forward cockpit. This aesthetic detail is dictated by the aerodynamic necessity of getting more lateral area ahead of the CG.



Webra Speed provides the motivation, while Silencaire muffler keeps things legal and quiet.



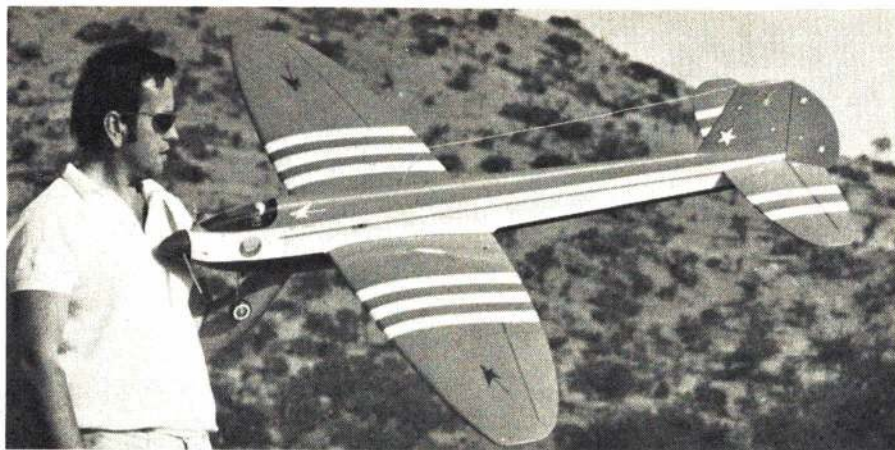
Mr. Brink gives some idea of the impressive size of this big bird. The wing looks like it came from a P-51.



Check the CG by placing the model atop a trophy. . . no, check the CG, then go out and get a trophy.

RIGHT: The author admires the elongated fuselage profile of his winning design.

BELOW: A trio of arrows. The one in the background has the original wing from one of the earliest prototypes.



mountings before applying the bottom sheeting. Complete as much as possible, and allow everything to dry thoroughly before lifting the wing from the building board. Turn the wing over and fit the locating dowels, hold-down screw reinforcements, aileron and retract mechanisms, hinge blocks, etc. Then complete the top sheeting. Trim off the excess LE material, cut out the ailerons, fit the wing tip blocks and sand to shape.

Now that the difficult part of the model is completed, the remainder is totally standard construction. Here are a few notes on some of the details.

To avoid compound curves, the fuselage is rather narrow—so plan ahead for the radio installation, and there should not be any difficulty.

Due to the size of the model, transport over long distances may present a problem, which the removable stab and rudder take care of.

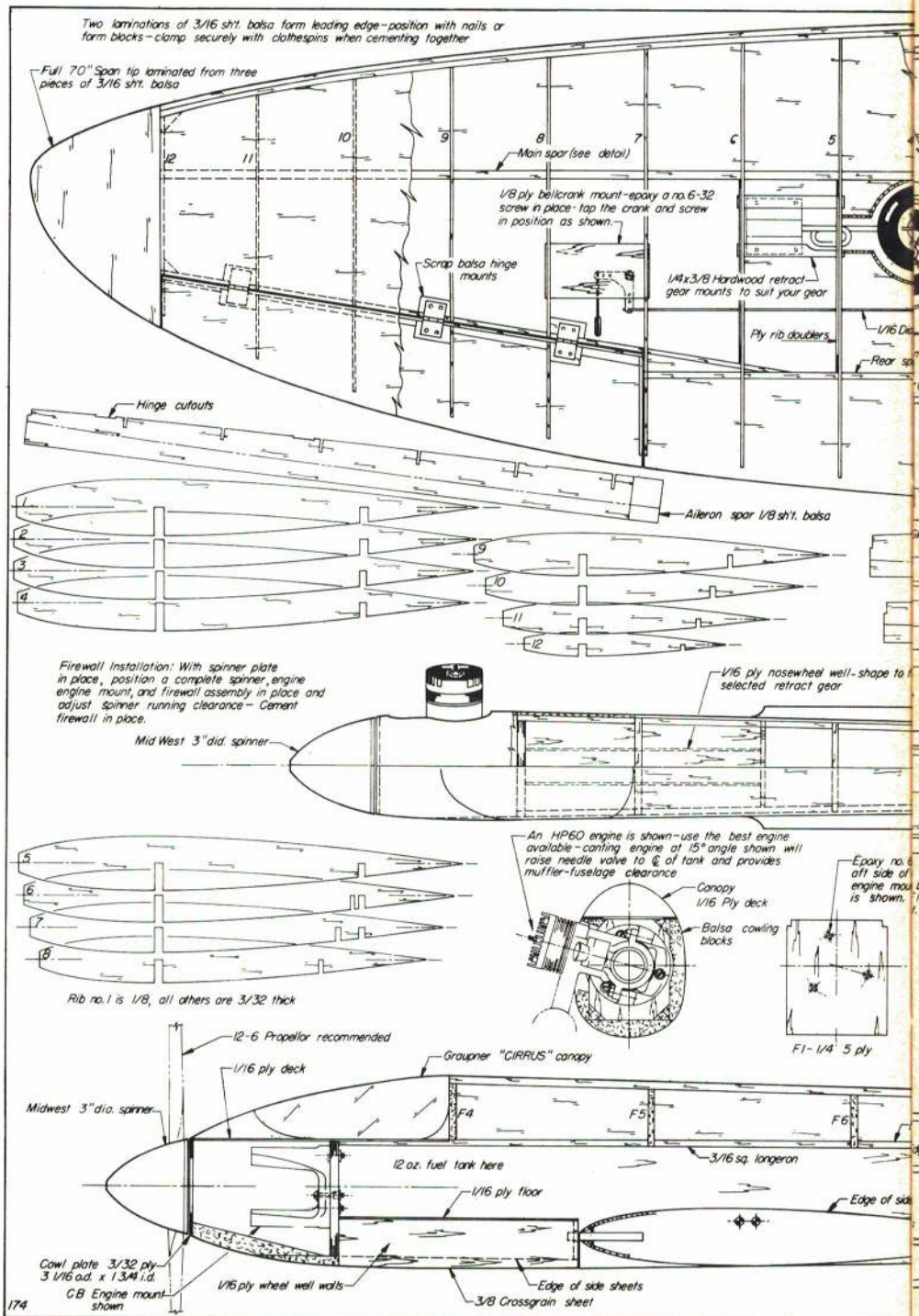
Fin and stab constructions may be varied to suit individual tastes. The method shown is quick, accurate and light.

Keep gaps at the hinge lines to a minimum. Either sloppy or too stiff control movements are both taboo. Build light—ballast can always be added if desired, and watch out for excessive weight build-up when applying that concours finish to the large flying surfaces.

FLYING

All the Novi Arrows built to date (at least six) have come out under eight lb., fully equipped, and they all fly like a dream. Trimming on the first flights has always been within the transmitter trim range. This is a graceful flying machine, so don't jerk it around the sky. Develop a flowing style of flying, which is not only easy on the nerves, but pleasing to the eye.

Contest successes for the Novi Arrow include a third at the 1972 South African Nationals, a first at the team trials, a first at the 1973 South African Nationals, and a spot on the team to represent South Africa at the World Champs in Gorizia. This last effort, at Gorizia, was dogged by engine problems, which prevented the true potential of Novi Arrow from being demonstrated.





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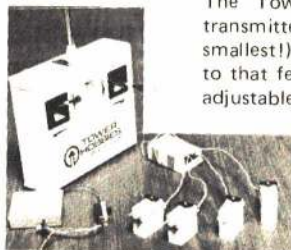
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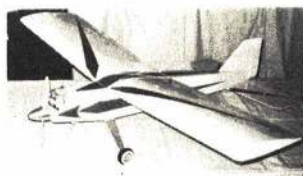
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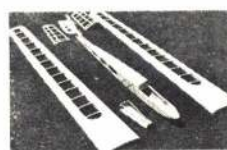


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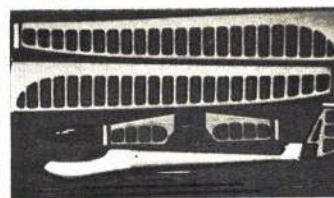
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H.B.

.61 RC w/muffler	\$130.00	\$80.00
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6-CHANNEL RADIO CONTROL

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The BA-607 monolithic IC has 73 transistors, 13 diodes and 79 resistors—a total of 165 parts.

The BA-606 monolithic IC has 2 PNP and 2 NPN type high output (500 mA) transistors, 4 diodes and 4 resistors—a total of 12 parts.

Futaba's new Proportional 6-channel Radio Control (FP-6DN)

The set includes Transmitter, Receiver, 4 small rotary servos, nickel/cadmium batteries for Tx and Rx, charger, a servo tray, spare servo horn, switch harness, neck strap and frequency ribbon.

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OSKER

The Ocopogo (Lake Monster) Meet is held every year on Lake Okanagan, in Vancouver, Canada. Of the five dozen planes which usually compete, the most popular is the Osker. / T.R. Thorburn

ABOVE: Big Osker (the 60-size version) successfully completes the author's favorite maneuver, a Slash-and-Go. (Photo by Ed Parkinson) **RIGHT:** Author holds the original prototype Osker. A muffled OS 40 is ample power for clean ROWs, as well as aerobatics. The short moment arm afforded by a pylon mounted engine is a definite asset in pitch maneuvers.



OSKER

Because I live in Vancouver, Canada, with the sea only a stone's throw away and many lakes resting still between the mountain peaks, I was moved to build a seaplane. That was four years and many seaplanes ago.

Difficulties always arise when I try to fill the car with picnic and camping equipment, and then try to stuff in a six-ft. seaplane wing and a five- to six-ft. fuselage. Then follows the cramped drive to the flying site. Out for a flight and... sploosh! Wet servos, as usual! \$%&*/t! Oh well, to the beer and sunshine for the day, while everything dries out. A beer, a chair and thought. Scratch, scratch—a finger full of dandruff and a thought: receivers sealed in plastic bags inhale water because the air in the bag contracts when the bag is immersed in cold water—thus a wet goodie.*

Scratch, scratch—another thought: an upright glass will hold water, but turn it upside down and it will not. (That's really profound thinking. It must have been the beer—Editor.) To date, all high-wing seaplanes use an upper access hatch to the radio compartment—the upright glass. An inverted glass, if used, would have to be held above the water. This would eliminate direct contact with cold water temperatures, thus reducing any water inhalation which may occur. Now, to keep the radio dry, we may as well put a lid on our inverted glass (the radio compartment) to prevent any splashing.

Scratch, scratch, flick—another blob of dandruff lost in the sand. How can I put the radio together, so that there are no extension plugs and only one radio compartment? Let's see—motor on wing, ailerons on wing, elevator on...

wing? Rudder on... wing? Ah! The whole radio in an inverted glass on the wing. Now what do we land on: a ski or a float? As usual, a float. Motor on a wing, wing on a glass, glass on a float, with the radio under glass—you're crazy! Let's try it.

The result of those misguided thoughts was Osker, my mid-sized seaplane. The desire was for a 35-45 size aircraft that would fit on the back seat of my car. Simplicity of construction and economy were considered, since sea birds eat a lot of green stuff.

Osker has a 56-in. span with a ten-in. chord. I was also after some performance, so I wanted the aircraft to be as neutrally stable as possible. This led me to the symmetrical wing with no dihedral. The angular difference is 0°-0°. However, with the high thrust line, I knew some up thrust would be required. How much was uncertain, so I made it adjustable—this was accomplished by an adjustable engine pod.

With these thoughts fabricated, I went to the seaside and gave Osker a try. What a shock! I did not bother checking the balance and I started off with 3° up thrust. Osker took off in five ft., jumped up eight ft., down five ft., up ten and down four. After two min. of this, I managed to flop her on the water. Balancing was achieved with nose weight and a few flights later, 1½° was found to be the best thrust angle. Now she will do double stall turns, inside and outside loops, etc. Now, if you are interested, take a clean swipe over your workbench and let's go!

CONSTRUCTION

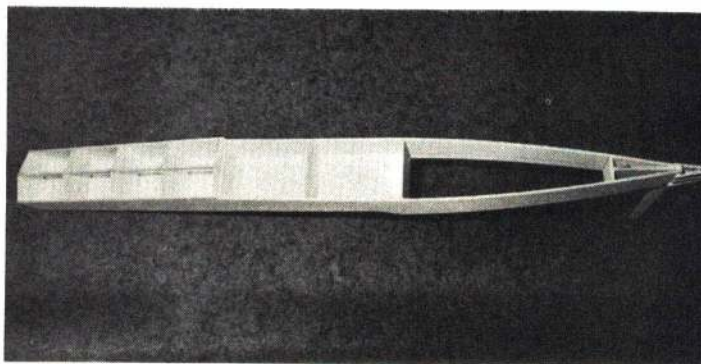
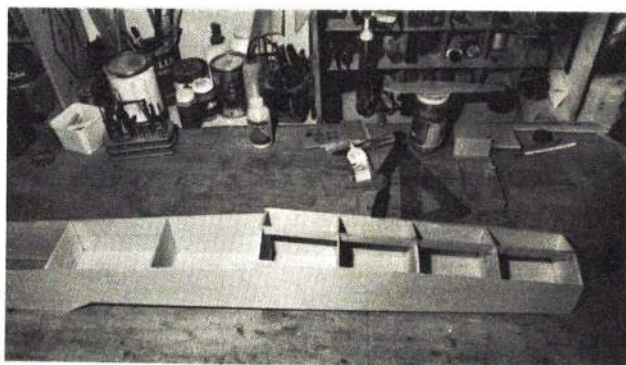
Start construction by cutting out the sides of the hull from 1/8 x 4 x 48" medium weight balsa. The widest bulkheads in the hull utilize four-in. wide stock. The top keel is 1/8 x 4" stock. Cut the front bulkheads to size, and the

top keel to length. Assemble the bulkheads and the keel on the fuselage sides upside down, checking for alignment. Put the center keel in the front. Sand the front hull to correct profile, and plank the bottom. Lift the hull from the board and install the sub-rudder; then finish the rear with cross planking. Put the one-in. sq. stock on the top front, sand flush when dry, and then cross plank the top bow. Carve and glue the nose block. This gives you the basic hull, with minor finishing details to be completed later.

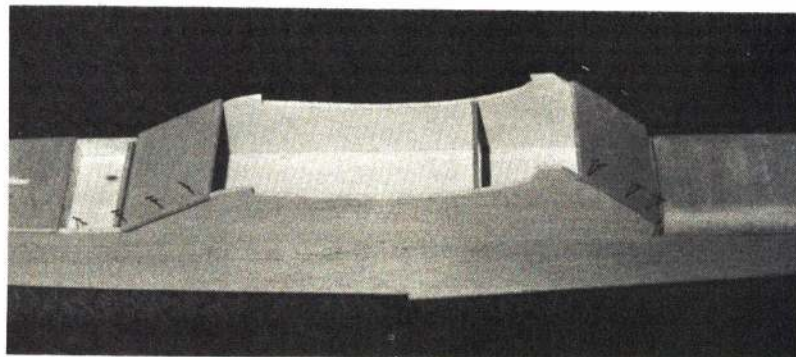
Now, on the top of the hull, build the (glass) cockpit or cabin assembly. Do not glue this assembly to the hull. At the same time, build the rest of the tail assembly. Cut the sides of the cabin and install the doublers and triangular stock in the four corners. Dry pin the cabin sides in position on the fuselage. Now cut and glue on the front and rear window pieces. Let dry, then remove the cabin. Now turn it over, and finish the wing with dowels and bolts. Check the cabin fit as you go. Cut and sand the tail surfaces, and mount as shown on the plans. Now the fuselage and tail assembly is finished.

Wing: The original has a built-up wing, but the aircraft has been built and flown with a foam wing. If you wish to

* Although this thinking may, at first, appear logical, a more reasonable explanation would be that it is not the contraction, specifically, that causes the condensation. Rather, it is the cooling effect on a hermetically sealed bladder. A bag sealed at building room temperature will condensate when the volume of air is compressed, either by lowering the temperature (a cold lake bath), or by changing the barometric pressure. The latter can occur just by flying at high altitudes. Usually, this effect is not significant enough to cause radio problems, unless you seal your radio initially in a very humid and hot basement. More probably, the bag isn't sealed properly, and allows outside H₂O to seep in. The model shown here has an air vent (the antenna tube), which maintains pressure and temperature stability.—php



ABOVE: The hull builds upside down on the bench. Bulkheads, top and bottom keels allow a properly aligned box-like structure. ABOVE RIGHT: Fuselage builds quickly, since there are no slow-downs for linkages, tank and radio installation. An hour of work to this point (if you're slow). RIGHT: Cabin compartment is a simple shell. Fit it, but don't glue it to the fuselage—it's later integrated as part of the wing assembly.



use foam, use a bottom hardwood (spruce) spar, at least two ft. long through the center section of the wing. The built-up wing has the hardwood spar doubler. A top spar is not necessary, since all top sheeting is continuous. This is not true of the bottom, where holes have to be chewed in the wing to accommodate the radio.

For the built-up wing, use 1/4 x 1/4 x 48" spars (two top and two bottom). To achieve the full span, slide two spars along each other and mark their overlap. Check for warps and glue together. (Do not worry about the 1/4 x 1/4" tip spar, unless you wish to build it up to 1/4 x 1/2" for convenience.) This spar system is handy, as it doubles the strength in the center, where it is stressed the most. Make a rib template, and cut the number of ribs required, or cut the foam cores. Do not forget the center 3/16" ribs next to the cabin. Now glue the 1/2 x 1/8" hardwood doubler to the bottom spar. Construct the rear spar in a similar fashion. Take a deep breath, and slide the spars into position in the cabin. Then slide the ribs into place. Build this dry or wet, as you wish. I found it was easiest to do the cabin and the base ribs wet, with the rest dry and pinned in position.

Next comes the important part. While this is drying, again sweep your messed-up bench clear. Place the wing and cabin upright on the bench, and weight the cabin down. Then provide supports and weights at four points (tips and half-span) on each wing panel, center spar and rear spar. Do the same to both sides. Also check to see if you aren't making an anhedralled seagull out of an Osker. To check warps, stand back from this plucked pigeon with its wings in traction, and visually align the front and rear spars. The wing alignment will be true when the visual space between the top or bottom main spar closes simultaneously with the rear spar, as you slowly raise and lower your eye level.

When this is set true and straight, then sheet and cap strip the top of the wing without moving it. Repeat the process with the propping, only this time with the cabin upside down. Sheet and cap strip the bottom of the wing. Now you can add the 1/4" sheet tip ribs. Install the aileron horns. Close the gap between the wing sheeting and the rear window with 3/16" scraps.

At about this stage, you could add the radio and paint, giving you a sail-plane for the lake; but I believe that castor oil helps waterproof Osker's coat.

Cut the engine nacelle parts from 1/8" plywood. Use epoxy to assemble these parts. Mount the vertical nacelle fins on the wing with epoxy. Let dry, then build a solid epoxy putty fillet along these units to increase the strength. After all this is dry, drill the units and mount the nacelle. Assemble the parts and you have the basic woodwork completed. To finish the hull, put the chines on the hull, and fiberglass the front portion of the hull only.

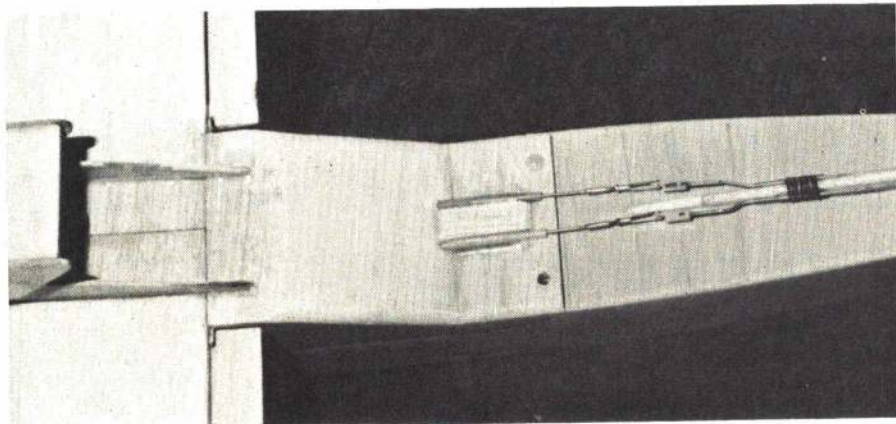
Now to the finish. I do not believe in playing flying saucers with fine china or vintage pewter, but rather in flying functional aircraft. My best finish is de-

veloped with two to four coats of clear and two to four coats of color—all sprayed on. Finish as you like, but keep in mind waterproofing. For example, I spray painted my wing twice before covering.

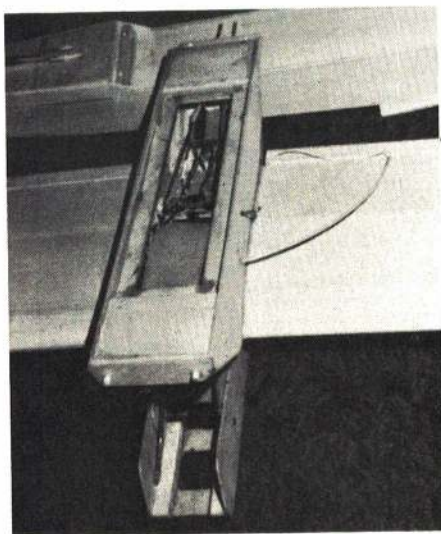
Install your radio and hook up your servos, using short lengths of copper tube and 1/16" wire, or nyrod pieces with wire stiffeners inserted. Use nyrod to connect the switch, and a six-in. length of inside nyrod for the antenna outlet, mounted tight under the wing. The only different detail is the rudder and elevator connections; I used nylon clevises on the servo end and 3/32" copper tube, with one end flattened, on the surfaces. Mount your engine, balance and head for the blue water!

*Text continues on page 94
Plans on following page*

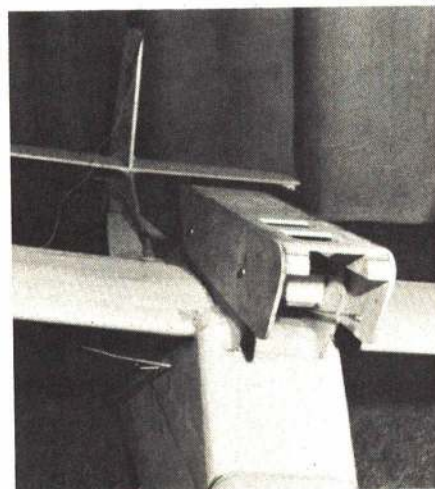
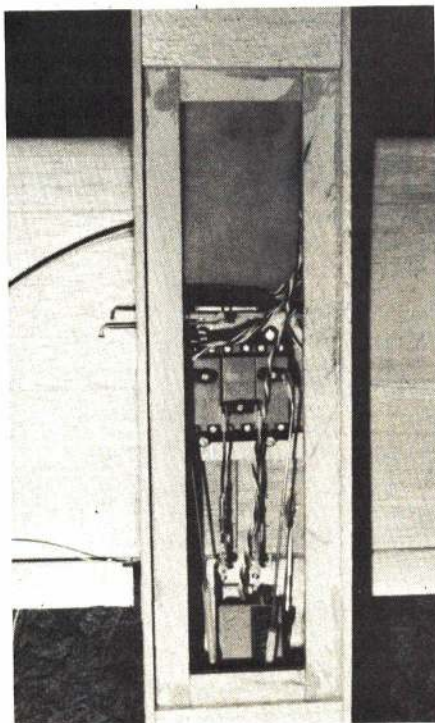
AAM Sudden Plan Service also has available a full-size plan for the 60-powered version of the Osker. See the Plan Service page for details.



ABOVE: Pushrods are music wire through Nyrod sheaths. Clevis connections are accomplished by snapping a Kwik-Link into a modified nylon clevis. The nylon clevis has the pin arm removed. From clevis to tail, straight music wires are supported, a la Ukie, by push-rod guides affixed to the vertical fin. BELOW: Detail shot of the engine nacelle. Note the throttle clevis installation. Lots of plywood, epoxy and Epoxolite needed here for strength and rigidity.



ABOVE & RIGHT: Just like a waterbed, the radio bay keeps the gear comfortable, yet dry. Principle is the same as hydro-boaters use. The radio is sealed in a waterproof box. A gasket of silicone adhesive is laid in around the edges; then a 1/8" plexiglass plate seals the compartment. Radio under glass.





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Heathkit "405" Systems put 8 channels—in either single or dual-stick format—in a package no bigger than conventional full-house transmitters. An exclusive IC encoder makes it possible. And there's a Heath-designed IC decoder in the matching receivers to trim size and weight there too!

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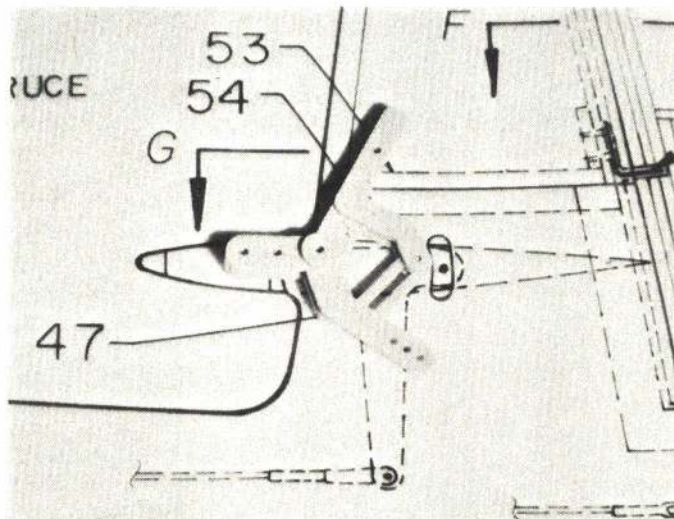
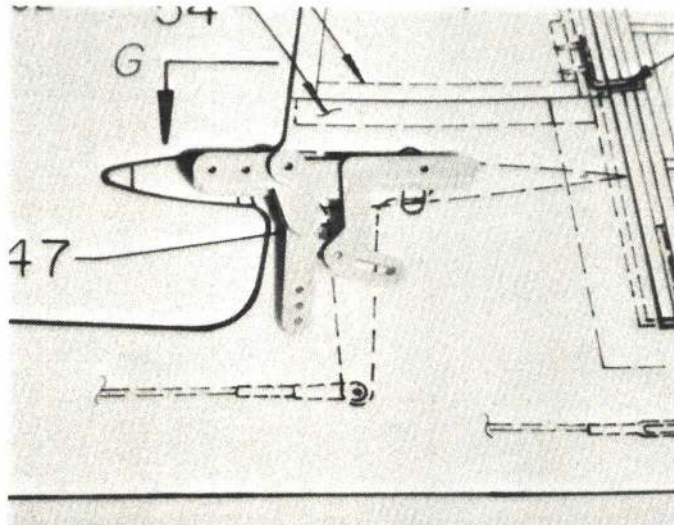
*Mail order prices; F.O.B. factory.

HEATH

Schlumberger

RC-106

RC GLIDER DETHERMALIZER



Detail of the "repositionable" RC glider dethermalizer.

The German aeromodeling publication *Flug und Modell-technik* recently published a four-part article about a new RC glider dethermalizer. The following is a condensed translation of Rudolph Herrmann's original text—Translator.

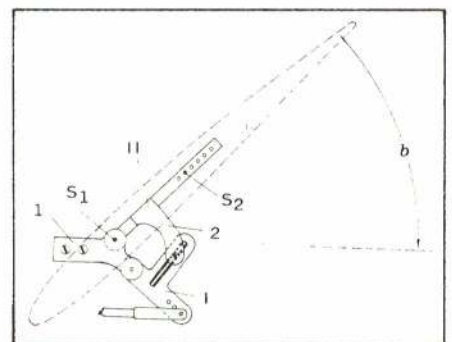
Most fliers have heard about the dethermalizer as it relates to free flight. In free flight, it serves to limit flying time in order to prevent excessively long flights in thermal "ups," and the ensuing loss of the model. Raising the horizontal tail surfaces to a 40° positive angle induces a stable vertical stalled flight which permits the plane to float downward at a constant rate of descent, like an elevator, slowly and surely to the earth.

The construction of the "repositionable" RC dethermalizer is based upon the most simple application of the proven principle of DTs, to suit the demands and potentials of the RC glider. A system with the following characteristics was developed:

1. The usual elevator function of a full-flying stabilizer is used. The dethermalizer does not require an additional servo. The elevator deflections necessary for standard flight remain very small and totally proportional.
2. The released dethermalizer can be reset at any time during the flight. Like spoilers, it can be actuated, then repositioned for normal elevator control.
3. The lever system is so compact that it can be easily built in as the standard control horn in any RC glider having a full-flying stab.
4. Use of the dethermalizer causes almost no additional weight (the unit weighs a mere 10 grams).

CONSTRUCTION

The entire mechanism consists of the following components.



1. A fuselage mounted bearing bracket (1), with bearings L_0 and L_1
2. An elevator mounting beam (3), with bored holes for the steel wire S_2 (for attachment of the two elevator assemblies)

MODEL TECHNIQUES:

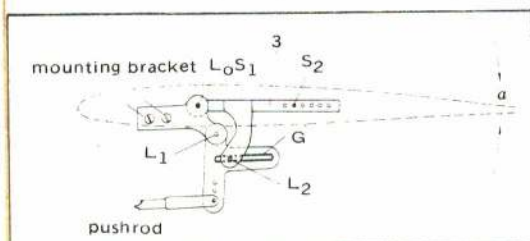
From Germany, a different way to get that sailplane back down. Why use spoilers, when you can autorotate, helicopter style, into the spot for a landing? / by Rudolph Herrmann
translated by J. Allen Miller.

3. A secondary control horn (2), which is tightly fastened to the elevator mounting beam (3)

4. A control horn (1) with steel-reinforced slide rail (G); on the lower end of the control horn (1) are the usual holes for attaching the pushrod or flexible cable.

OPERATION

The fuselage mounted bearing bracket (1) is rigidly fastened to the tail of the fuselage, or the side of the tailboom, with two screws. The elevator mounting beam (3) and the secondary control horn (2) form a lever (II) which is hinged at the bearing L_0 . The music wire rod S_1 , together with the wire rod S_2 , supports the elevator unit, and forms the guide pin of bearing L_0 .



Lever I rotates by means of lever bearing L_1 . The pushrod wire, which comes from the servo, is attached at the lower lever end.

The two control horns, I and II, are so attached (by means of the bearing pin of bearing L_2) that bearing L_2 moves along the slide rail (G). This movement causes a differential enlargement of the lever arm.

Half deflection of the servo moves the elevator unit in the arc marked a . Because of the small ratio of travel in this range, the elevator trim can be very finely varied.

The elevator unit traverses the sector in the second half of the angle of rotation of the servos. The elevator is brought to an angle of about 45° (thus making it effective as a dethermalizer) by means of the extended lever arm.

A reverse movement of the servo restores the elevator to its initial position (thus repositionable). Modification of lever I, or changing the curve of guide (G) allows enlargement or reduction of (respectively) sectors a and b .

APPLICATIONS

Experiments have shown that an angular deflection of the elevator to 25° to 30° is sufficient for the dethermalizing effect.

The degree of stalled flight is determined by the angle of inclination of the last part of the deflection. With positive empennage inclination or more than 40° , the air current will rip against the

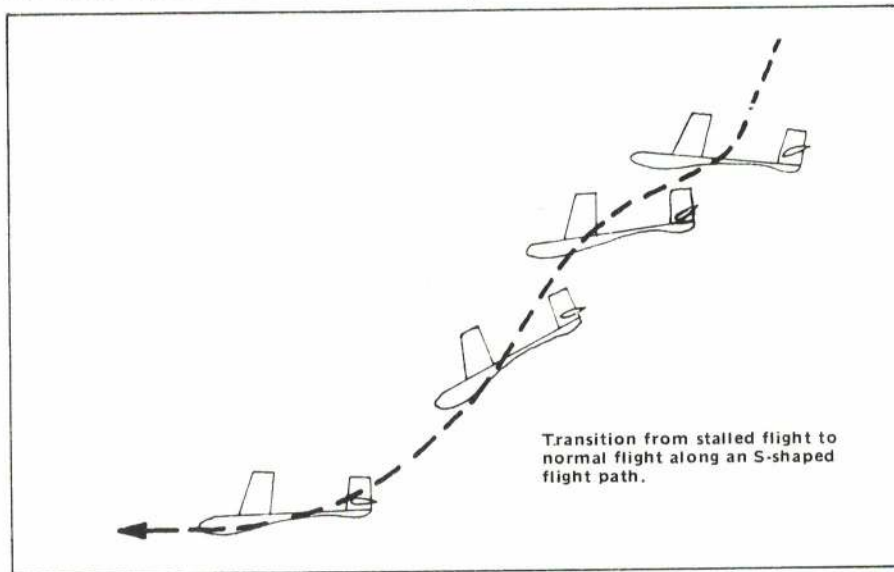
airfoil. The susceptibility to spins during the transition to stalled flight is minimal, and the plane, after several short jerky rises, floats perpendicularly down to the earth.

If the maximum deflection of the elevator is lessened, the plane is more susceptible to spins during the exit phase of the stalled flight, and needs longer before it quiets down into a stable stalled flight. However, a small deflection has this effect: to the vertical primary movement in the stalled flight comes a horizontal movement. The plane then floats from the constant horizontal position it has maintained slightly forward and downward. The forward movement produces on the vertical tail area an air current in a longitudinal direction, so that the vertical tail area regains effectiveness. The plane can—in this floating state—be turned through the use of rudder, and literally pivoted on a point. Because of the good maneuverability in this flight situation, and because of the relative forward movement, a vertical spot landing with an RC glider can be easily accomplished. The ability to turn on its own axis, and the vertical approach landing, reminds one of the flight of a helicopter.

itself to be harmless, as the glider lands on the ground in a flat attitude. The inner wing tip touches down first and forms the pivot for a harmless ground loop, into which the entire kinetic energy is converted. The stable spin is ended either by steering the rudder strongly in the direction opposite the turn, in order to achieve normal stalled flight, or through direct transition to normal flight.

A swift repositioning of the elevator unit into the normal position results in a pitch change. This change occurs in the following manner: the removal of the dethermalizer affects the plane in stalled flight like a strong elevator deflection, and pushes the nose downward. The plane flies obliquely downward. Thereafter, due to positive angle deflections, the plane makes the transition to a normal glide. This transition is executed along an S-shaped flight path (cf. illustration). The forms of flight behaviour typical of craft utilizing this device can be used to advantage in several ways. Based upon past experience, different application possibilities are described below.

The dethermalizer unit has especially proven itself in thermal flight. A good



To start, one should induce the plane, as far as possible, to make the transition from horizontal flight into dethermalized flight. After a few practices, it is possible, by pulling the dethermalizer, to bring the model out of the turn attitude into a uniformly narrow spin. This spin effect can be used to increase the rate of descent during stalled flight, thereby easily getting the plane out of the strongest thermals. The spin, which can be slowed or accelerated by adjusting the elevator, has demonstrated

thermal can be exploited, almost to the boundaries of sight, before the glider is then brought down to a lower altitude for further flight. Because the risk of wing breakage does not have to be dealt with, gliders with less wing loading, and which react well to weak thermals, can be used. Because of the ability of the dethermalizer to be reset, it is not necessary to carry out stalled flight landings with heavy gliders.

(Continued on page 98)

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1-8 flite pak



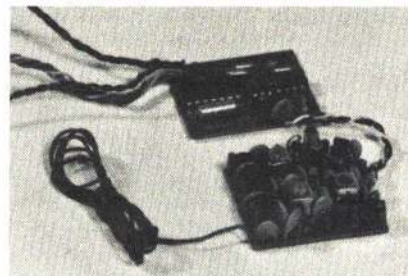
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DESIGNED BY ROMEY BUKOLT



SPECIFICATIONS

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Area--225 sq. in.

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Power--.049 to .051.

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STAG

England is a small country, with some of the world's best slopes — the ideal place for a concept like the Stag. Advanced aerodynamics can be artistic, as well as functional.
by Ian Edlin

A few years ago, I had an idea for a new wing geometry. Take an efficient low aspect ratio wing. Add swept back anhedral panels to its tips, in order to reduce tip spillage and the associated induced drag. Then stabilize this wing by adding high aspect ratio outer panels with tip dihedral, and concentrate the area at the tips by the use of an inverse taper.

Well, I built a glider to test this wing shape, and although it didn't prove my theory completely, it did provide me with a most unusual model. It is very stable, both on and off the towline, and is great fun to fly.

Much of my flying is done in the local park, which I share with a herd of deer. This fact, together with the antler-like shape of the wings, suggested the name Stag.

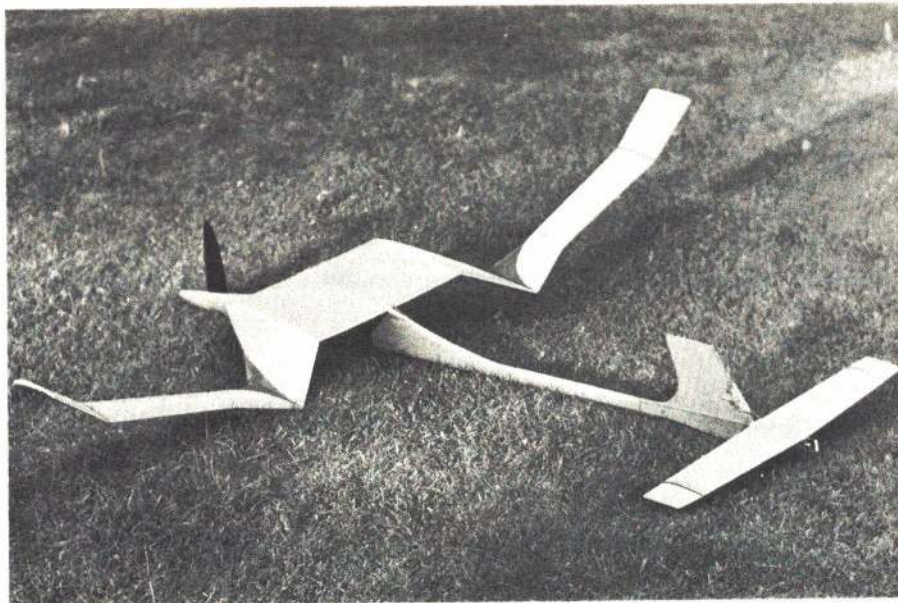
With the aid of a forward fin, the Stag has also shown an ability to hold its nose into the wind on a slope. In fact, I used it initially as a slope soarer.

CONSTRUCTION

Take special care to choose light balsa for the wing and stabilizer (except for the tongue box, which should be built of stronger balsa). The 1/8" sheet fuselage sides should also be light, while the central 3/16" core should be of strong, straight-grained balsa. This should be checked for trueness—a bent fuselage could cause undesirable flying characteristics.

Wing: While the construction is generally quite straightforward, the method for building the wing is a little unusual. It is basically a Jedelsky structure, with a sheet-covered undersurface. Balsa sheet blanks are first cut to the shapes shown on the upper part of the drawing and the ends bevelled, where necessary, to accept the dihedral and anhedral. These ends are then thoroughly pre-cemented by rubbing cement into the end grain. (The tip dihedral is not incorporated until later). The blanks can now be cemented together, with careful checks being made to ensure the correct angles by resting the inner panels on a flat surface, as shown on the drawing.

When dry, the joined blanks can be carved and sanded to shape. Remember to leave the rear edge 1/16" thick. The tip dihedral can now be incorporated



By utilizing the forward vertical fin, the Stag becomes a sport slope soarer. The front vane keeps the model tracking into the wind off the hill.

and the optional lightening recesses removed, if desired.

The tongue boxes should be built sturdily, and bound with fine strong thread and cement. The thread must be fine (I used transparent nylon), as the plug-in slots in the wing should be no deeper than is absolutely necessary. After cementing into position, the boxes are strengthened by a piece of 1/32" ply glued to the underside of the partly finished wing, using Titebond glue. The 1/32" balsa shims can also be added, in readiness for the undersurface sheeting.

The rear top sheeting is now cut (note the grain direction), and the trailing edge pieces are added to the inboard sections. The sheeting is then joined, and cemented in place, followed by the support ribs.

When thoroughly dry, the bottom sheeting is added using Titebond. Pin everything in place until dry. If the wood is light and flexible, this operation will be straightforward, and the stiff leading edge should prevent warps. However, keep a careful check for warps by pinning strips of balsa chord-wise across the underside of the wing, and viewing from tip to root. Aim for wings with no warps, or very slight wash-out in both wings. After the pins have been removed, the wing can be checked by laying it on a flat surface, one section at a time. Finally, add the ply root cap ribs and sand the wings smooth.

Fuselage: The fuselage is begun by assembling the 3/16" center lamination on a flat surface. Each of the side laminations should be tapered in thickness, where shown, before gluing. While the laminations are drying, the fuselage should be held onto a flat surface, by means of suitable weights, to prevent distortion. The tongue slot is best cut in each lamination separately, leaving excess material on top. The tongue can then be used to align the laminations as they are assembled. Check that the tongue is square to the fuselage, when

viewed from the front. The excess material is sanded down after adding the ply capping ribs.

Before adding the side sheets to the nose, the model should be assembled, and weight added to achieve the balance position shown. One of the side sheets can be very lightly cemented in place, so that changes to the nose weight may be made on the field.

The DT and autorudder shown are simple to install and are quite satisfactory for fun flying. When cementing wire to balsa, cement should first be rubbed into the wood over a reasonable area. The wire is then glued in place. When dry, two additional layers of cement are smeared over.

The forward fin should be attached after finishing so that, in the event of impact, it will snap away easily and need only be recemented in place.

FINISHING

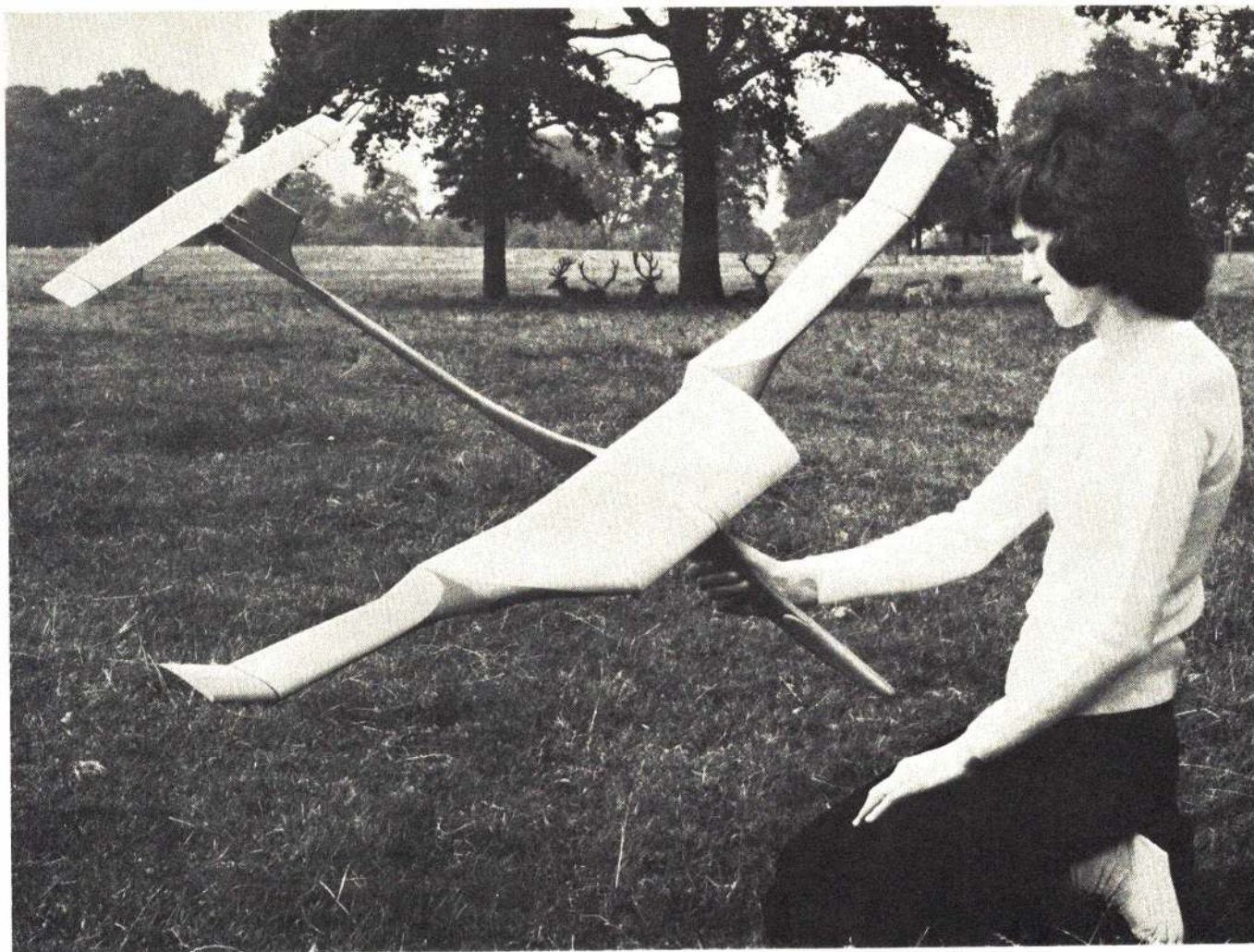
The original model was covered with red and yellow lightweight tissue. Everything except the stabilizer platform and wing attachment surfaces should be covered. The weight of tissue covering was quite acceptable, but the performance could possibly be improved by applying only two or three thin coats of sanding sealer, sanding lightly between coats (three coats on wing and fuselage, two on stabilizers).

Color trim may be added as on the original. Enamel paint should be used sparingly, or strips of tissue may be doped on.

FLYING

Insert a paper clip in the autorudder release device to hold straight rudder. Then test glide, first on level ground and then from a gentle slope, if possible. Adjust the stabilizer with shims, and adjust the autorudder stop if necessary, until a flat, straight glide is obtained.

In this trim, the Stag can be flown into a slope breeze. It should maintain or gain height as it moves outward from the slope.



ABOVE: The author's wife, Janice, contemplates the "stagging" wing geometry of the Stag. The scene is Wollaton Park, near Nottingham, where many of the model's early flights were made. The stags under the trees gave the glider its name.

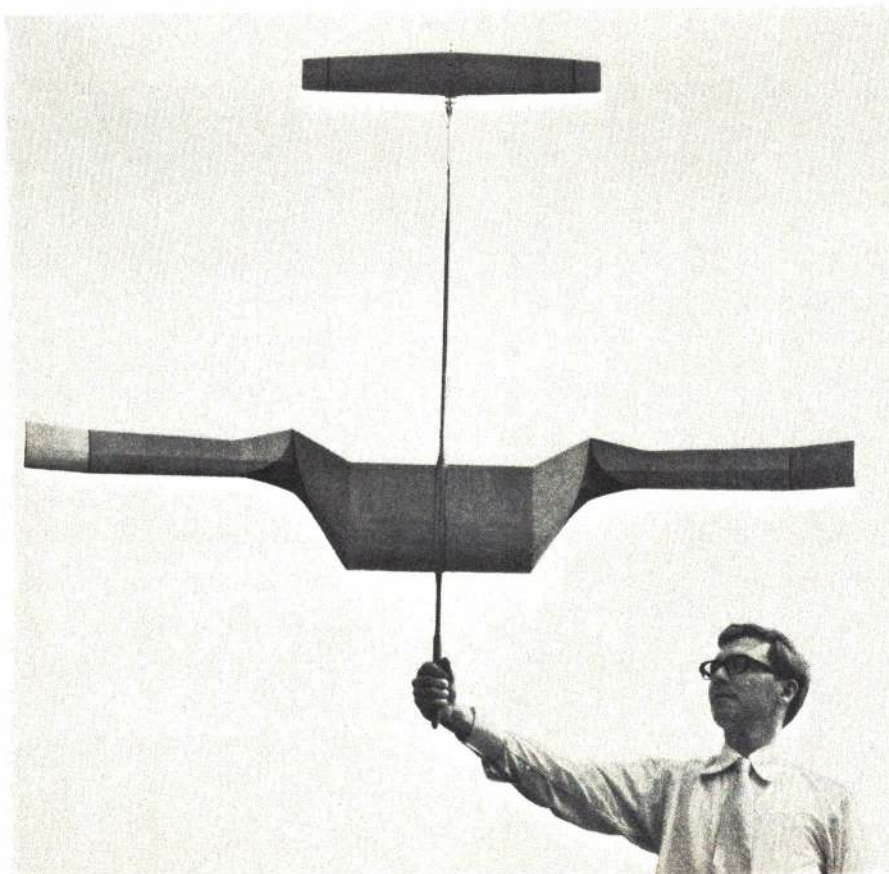
RIGHT: Author shows off his unusual creation. That's what happens when you probe into the aerodynamics of a wing. Even with all the jutting angles, the structure is quite strong.

For towline flying, remove the rudder alignment paper clip and adjust the turn stop for a gentle turn. It may be necessary to adjust the stabilizer shims again very slightly to maintain a flat glide.

If the stabilizer leading edge requires shimming, it may be necessary to increase the height of the stop, to prevent the stabilizer from riding over it. In any case, always check the stabilizer, autorudder, and wing tightness before every flight.

Now tow the Stag up on a medium length line (50-75 ft.), being careful not to stall it on release. Make any further adjustments that are necessary, and then fly on a full-length line.

The aerodynamics of the Stag's unusual wing planform and geometry make it a very capable towline glider or slope soarer. The eye-appealing lines of this soarer will get many favorable comments wherever it is flown.





SPECIAL INTEREST

Whirlybird a la Parisien

Every flier's dream. A seven-day, all-expense paid trip to Paris—and all you have to do is fly your helicopter in a contest. But as it turned out. . .
by Dave Gray, art by Robert Godden

First, a little background to this story. We, at Du-Bro Products, were asked by Tenco International of Brussels, Belgium, one of our large distributors, to come to Paris for a helicopter contest. This request came just three short weeks before the day we were expected to be there. The first problem . . . not much time. It was finally decided, just one week before leaving, that my wife and I would go. I would compete with the Whirlybird 505 in Paris. The next problem was that we had seven days in which to get passports, a process which usually takes seven weeks.

The Whirlybird was packed in a large box, along with the transmitter, flight box and all sorts of replacement parts. After all, I was going to be flying in a week-long contest. I had asked Ed Sweeney if he thought his readers would like to read about this big helicopter contest; he said definitely. So cameras and lots of film were readied. With only five days left, and while making final arrangements with the people at Tenco in Brussels to meet us at the airport, we learned that we would be flying the Whirlybird in Belgium during the week. The "Big Paris Contest," or Grande Circe as the French called it, was only a weekend affair. At this point, we didn't know what to expect.

We were to leave Chicago on Sunday. It was Friday, and we still had no passports because we were still waiting for our birth certificates from our home states. We called the passport office and were told that we could get them while we waited, if we could come to the Chicago passport office with our flight tickets. So we rushed to the Federal Building, up to the passport office, filled out the necessary forms, and were told to come back in three hours. That was noon—so we ate lunch and went window shopping, but made sure that we were back at the passport office by three o'clock sharp. We were then told that the computer had broken down, and we would just have to wait. This was our last chance. . . the office closed

at five o'clock and wouldn't reopen until Monday morning—and we were to leave Sunday afternoon! At 4:30, the passports were ready; so we thought we were ready to go.

The next day, when I went to pick up the helicopter at the shop, I found out that we could only take 88 lb. of

luggage with us. Great! The Whirlybird box weighed 65 lb.; that left 23 lb. for suitcases, cameras, and clothes for two people for ten days. We were told not to count what we carried on the plane with us, so we stripped the box and put 13 lb. of parts in my briefcase. We put all the heavy items, such as deodorants,

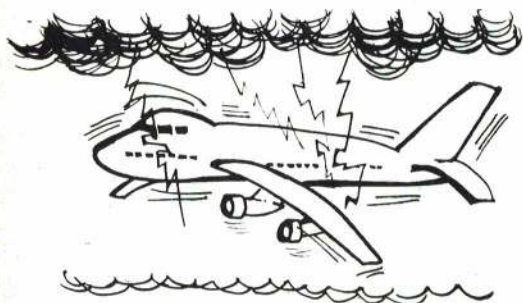




toothpaste, and battery charger, in a small carrying case. My wife put the cameras and film in her large purse. Now all we had to do was cram four suitcases of clothes into two small ones. We got out the baby scale and weighed everything that went into the suitcases (leaving lots of things out) and, at last, had a total of 90 lb. So we're ready to go. All problems had been solved.

But, wait... as we were taxiing out to the runway in one of Air France's big 747s, I noticed a very large, black-looking storm heading our way. Before we could take off, the storm hit. The pilot said we would have to wait for the storm to pass. As we waited, the storm did indeed hit us and passed from west to east. We took off 45 min. late, right into the storm.

At this time, I should say that this was my wife's first flight. I had been telling her how nice it was to fly... like sitting in an easy chair in our living room, and they served such good food. Soon after takeoff, I knew that this was not going to be one of those smooth flights. But the stewardess served the drinks as we bounced out over Lake Michigan. About that time, the plane gave a lurch, and it felt like we were on an elevator going up... and then the bottom fell out. Drinks shot to the ceiling. Our cameras and belongings stowed



under the seat were scattered on the floor.

I'm not sure how far we fell, but it was too far for me. My wife was ready to get out and walk. That spoiled all thoughts about food and relaxation.

We arrived in Montreal one hour late and had to run to the other end of the terminal to catch our flight to Brussels. I was hoping that the luggage and the big box with the Whirlybird would follow us. We finally found the gate where our plane was waiting... more trouble. It was a small Sabena 707, which was filled to capacity for the eight-hour flight ahead of us. Well, on to Brussels—although my wife suggested that we take a slow train home, and I must admit it sounded good at that time. Except for a sleepless night, the rest of the trip to Brussels was rough but uneventful.

We arrived in Brussels at 10 A.M. For the first time we found ourselves in a completely foreign country. Since we only speak English, we knew we had another problem. With a sigh of relief, we found our luggage and the Whirlybird box, and breezed through customs. We were met at the gate by a representative of Tenco, the company that had arranged this fun-filled outing.



Next problem... the box wouldn't fit in the small car that our host drove; so we left the box at customs and drove to the Tenco office, about a 30-min. drive into downtown Brussels. This drive was an experience in itself; but, I thought, well, I can stand anything for 30 min. When we arrived at the office, I thought that we had it made and could relax a bit. It would be nice to pull ourselves together after the wild flight, the sleepless night, and the frightening ride through downtown Brussels' traffic.

But, we learned that we were going to be staying for a week in the small town of Knokke, on the North Sea. This meant another drive, which took about two hours, including going back to the airport to get the box. Well, we finally arrived in Knokke, a beautiful town on the "Sea Side" (as they say in Belgium). We had lunch and were told that we would not start flying until Tuesday morning. We went to the hotel and got some sleep, which was sorely needed! It sure was strange going to bed at 3:30 in the afternoon.

Tuesday morning was bright and sunny, but very windy. So we decided to fly the demonstration flights inside. I readied my Whirlybird, and then checked out Leon Janssen's Whirlybird. Leon was our host for the entire week. He and his family made our stay in Belgium very pleasant. Now to the flying... Leon said that he had arranged for us to fly in a large empty garage in case of bad weather. So, off to the garage we went, with about six top hobby dealers and distributors along as observers.

As we came within sight of the garage, I thought we had it made. It was a large hangar type building, about 30 ft. high, 40 ft. wide, by 50 ft. long. Just right. Wrong again... inside I found that only about half the building was open, and in that space were several cars, some rabbits, tables and a dirt floor.

They wanted to see the Whirlybird fly, so I prepared to fly my helicopter. When the engine started, the dust was so thick that I could hardly see to fly, but fly we did. I had to stay about 10 ft. up to keep above the dust, where all could see it fly. After that flight, which they thought was great, we brushed the dust off. They wanted to see Leon's Whirlybird fly. After a few adjustments, I took it off and it flew just as well as mine. That really impressed them, to see one of "their" Whirlybirds fly.

The rest of the week went about the same. Each day I flew for a different group of people. I checked out other Whirlybirds and showed the owners that theirs would fly just as well as mine. We fitted most of them with our training gear and, after flying the model for them, they would try. I am sure that within a few weeks they all were flying very well.

The only real problems I found with their Whirlybirds was that most people had not built the pushrods properly. Either they had made them solid, or else the solder link would not slide freely on the rod. The main control pushrods *must* be spring-loaded and very free, so that only the spring moves the swash plate.

As the week went on, I began to get used to Belgian driving... although there was no way that I would drive. Leon kept telling me to just wait until we were in Paris; the traffic is so bad that he wouldn't even drive in it. I also learned that the contest to which we were going was not a helicopter contest at all! In fact, I would probably be the only one there with a helicopter. On Friday morning, we loaded the Whirlybird, luggage and a lunch into the car. We were off to Paris. It was about a three-hour drive, mostly on expressways and tollways, very similar to the roads in the United States.

When we finally arrived in Paris, I found out that Leon had been right about Paris traffic. It was unbelievable and totally undescrivable. I can say that you could not pay me enough to drive in that traffic jam. After making a few wrong turns and stopping a few times to read the map (which was in French, so I was no help), we finally found the Tenco office.

First they took us on a tour through their warehouse. Then they took us to the hotel around the corner, which was a real experience in itself. It was a typical little French hotel, with a very small open elevator. It would go UP only and it didn't work too well. There was absolutely no humor in the fact that there was only one toilet on each floor.

Saturday: We were supposed to be at the flying field by 10 A.M. The field was south of Paris, about a one-hour drive from our hotel. We were told that this was the biggest contest in Europe, and usually had a crowd of 10,000 to 15,000 people. The contest was held at a government airfield. We arrived at the agreed time, but only a few fliers were there, so I figured that things probably didn't get started until noon.

By 3 P.M., there was still no action. Then I found out that Saturday was just a practice day, and that Sunday was the BIG DAY. Well, it was too windy for me to fly anyway, about 30 mph. All the club members wanted to see the Whirlybird fly, and they said that they had a place to fly inside. I asked how much room we would have, and they told me that the room was big, with a 40-ft. ceiling. I thought that this would be great!

We had supper. . .like most of their meals, it lasted three hours. Then we all met at the club house. We were ushered out to another part of the building where we could fly. They were right—the ceiling was about 40 ft. high, but the room was only 20 ft. square, with tables, chairs, ladders and other things stacked here and there. Well, it was too late to back out now. . .nothing to do but fly. So I started to fuel up the Whirlybird, and the club members began to squeeze into the room, about 25 of them. They were standing all around me, some up on the ladder, some standing on boxes. As I was ready to start the engine, they asked me to wait a minute, because some more people were coming to see the flight. I looked around and wondered where I was going to stand. There was just enough room for the rotor blades to turn and then it would have to go straight up. I told them I would fly it again so that the other people could see it fly too. I made the flights, during which flash bulbs were flashing like Fourth of July fireworks. After the flight, we all had a round of champagne and then they cried, "Fly it again." So back to the tower for another flight. Then another round of champagne. Well, so much for Saturday.

Sunday: We got up early because we were supposed to be at the field by 9 A.M. But, when we arrived at the field, again I was surprised to see very few people and no flying going on. Also, the wind was bad again, about 20-25 mph. By noon, I was getting tired of sitting around and was ready to leave. But there were the beginnings of a crowd . . . though a long way from 10,000 people. Still no flying.

As we left for dinner, I asked when the flying was going to start, and was told that the show was from 2:00 to

6:00 only. Now this "week long" contest had diminished from 10 days to a four-hour show. Really, it was no contest—just a crowd pleasing show, with lots of balloons, streamers, leaflets dropped, bombs dropped, houses blown up, etc. Sometimes there were 10 or 12 models in the air, just doing their own thing.

It was so windy that I could not fly my Whirlybird. We kept hoping all afternoon that the wind would die, but by 5:30 it was still blowing. I then suggested, half joking, that they move a nearby large chartered bus, which had brought people to the show, out on the field for use as a wind break. Fifteen minutes later, the bus was in position in the center of the runway and they were ready to watch the Whirlybird fly.

I flew, but the wind was terrible and the flight was not much. At least they had seen it fly. And then, would you believe, at 6:15 the wind died to absolutely 0 mph. By now, many of the 10,000 or 15,000 people who did finally show up, were in their cars and leaving. But I did fly the Whirlybird for the ones who were still there, mostly the fliers and club members. They saw probably the best flying of the whole week.

So the Big Paris Show was over, and I had just one more flight to make on Monday, back in Knokke, Belgium. Then homeward on Tuesday. All in all, the week had been well spent. We had convinced a lot of people that the Whirlybird really does fly.

But our problems were not quite over yet. The man at the ticket counter in the Brussels airport forgot to give us our boarding passes. We were ready to

board the plane to London when they told us we must go back and get the passes. I told my wife to wait with our carry-on luggage, while I went back to get the passes. I was told to go to the information booth, which was back on the other end of the terminal.

But when I asked about the passes at the information booth, they told me I would have to go to Gate 25 which was again back near the gate where we were supposed to be getting on our plane. I looked at my watch. . . I had 20 minutes until the plane was to take off. Back at Gate 25, they knew nothing about any boarding passes and, in fact, told me that our plane had already left! I tried to tell the man that the plane was loading at that very minute in the next gate and that we had to be on it in order to make connections in London. He made some phone calls, and then took me to the gate where the plane was waiting. He was explaining something to the people at the gate. I then found out that I had gone to the wrong information booth in the first place, so it was back to the other end of the terminal. . . again. This time, I ran all the way, because I only had 10 minutes left. This time, I got the passes and got back to the gate just as the last passenger was boarding. We had no trouble during our one-hour lay-over in London, or the eight-hour flight from London to Chicago.

Well that was it. We were finally on our way home with many memories and many new friends. I would like to say that we would have never lived through it if it had not been for the wonderful hospitality of the entire Janssen family during our stay in Belgium and Paris.



SPORT

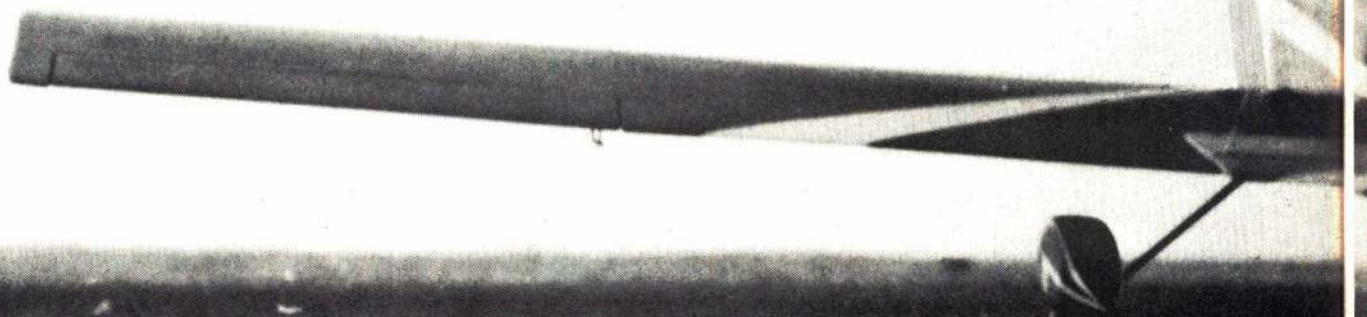
International modeling isn't necessarily a global cold war affair. A hot spot is Tripoli, where you get shot at when you go flying. It's also where semi-scale sport trainers, like the Akromaster are found.
by Arnold P. Milton

We all have an idea of what a perfect model airplane should be. In most cases it is probably based upon the modeler's flying, building, and financial abilities; and, perhaps, geographical location. This is the story of my perfect airplane.

Three years ago, I found myself beyond the initial training stage in flying ability, after crashing Jim Kirkland's Beachcomber, Nick Zioli's Pitts Special, and a self-designed 1000 sq. in. glider-type "thing" that was never meant to do aerobatics with a ST 71. Thus, after learning the rudiments of flying the way a lot of us unfortunately seem to do, I was ready for an airplane that could train me through the intermediate stage and into expert flying. I decided that a large plane with precise, but not critical, flying characteristics was required. It should be capable of all aerobatics and, therefore, be high powered with light weight.

About this time AAM (February 1970) carried a story on the Spinks Akromaster with an accompanying article about computer and wind tunnel designed airfoils by Dr. Walter Good. Portions of both articles were incorporated into this design.

The model utilizes the symmetrical E 747 airfoil, which gives excellent inverted and slow speed performance. The model differs from true scale, in that the fuselage is narrower to expose the top cooling fins on the side-mounted ST 71. Big engines can develop heat problems if improperly cooled. I also



Spinks

thought it improved the model's appearance. The nose is altered slightly to facilitate cooling and building. The wing and tail have straight leading edges—also for easier building.

Although the plane is not designed for the novice builder, the lines of the Akromaster adapt readily to simplified model design and rapid construction. Building speed might be shortened by using Profoam, in place of the formers and sheeting, on the top of the fuselage. The wing can also be easily made from foam, by using the base and tip templates shown on the plans.

The basic structure of the nose, the motor mount beams and three plywood formers (including firewall), should be epoxied together first. Cut out the 1/8" aluminum mounting plate to fit your engine, drill the mounting holes for the plate in the maple beams, and mount the plate to the beams. The beams should be parallel and correctly spaced. Slip the three plywood formers on the beams and epoxy in place. Do this over the plans and be sure everything is square. Add the fuel tank box after the epoxy has set.

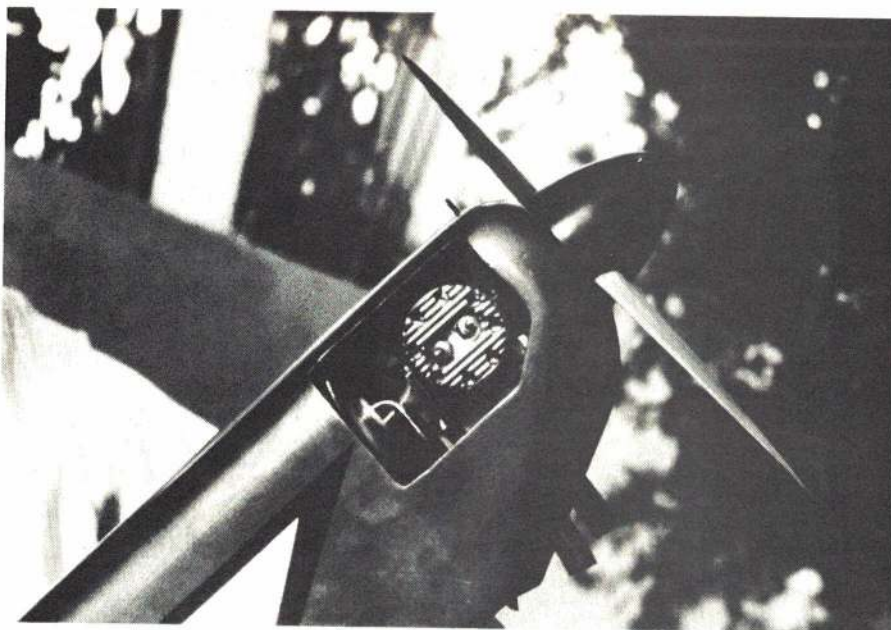
The two sides should have the wing saddles, stringers, and 1/4" vertical sup-



With the Mediterranean in the background, the author's wife, Jenny, poses with the Akromaster on the coastline near Tripoli.

A large, close-up photograph of the Akromaster model airplane, showing its high-wing structure and fuselage. The plane is dark in color and is positioned diagonally across the frame.

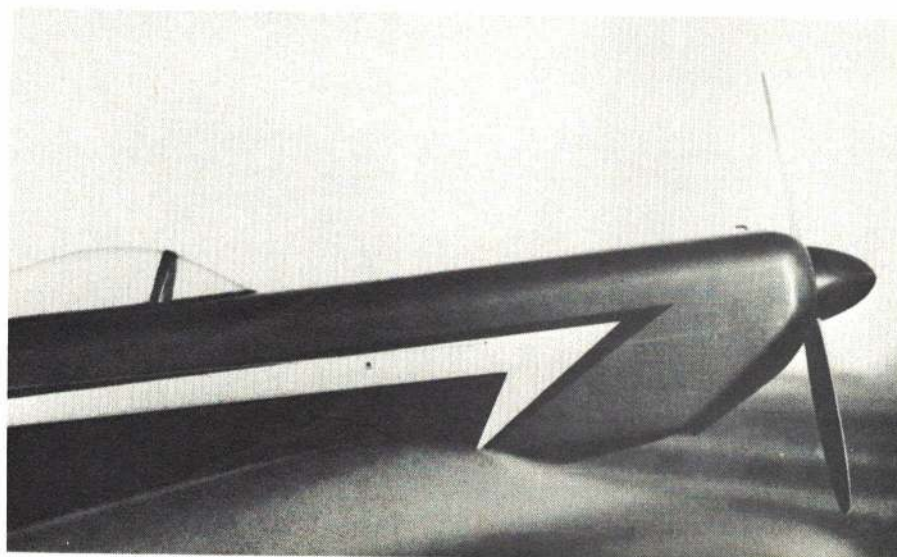
Akromaster



ABOVE: ST 71 is very comfortable in the spacious nose. The tank protrudes through the bulkhead for easy inspection. Tatone manifold ducts the goop out the bottom.

RIGHT: "Gee, Daddy, it's bigger than me!" remarks the author's daughter tactfully, as she permanently impregnates the dope finish with bubble gum (plasticizer).

BELOW: At last, a good looking box fuselage. Straight lines can be handsome.



ports glued in place prior to mounting them to the nose assembly. An important point in this regard is to postpone gluing the top $3/8$ " sq. stringers to the $1/8$ " sheet sides aft of the cockpit until these stringers have been joined at the tail. Do this after the sides have been glued to the nose assembly. This will aid in accurately lining up the fuselage, and will establish a "bend line" where the fuselage breaks sharply toward the tail. The top stringers should be spliced and glued at the bend line, as shown on the plans, prior to gluing them to the forward part of the fuselage sides, and before the attachment of the sides to the nose assembly.

Everything else is "follow your nose" construction, with the possible exception of the wing ribs. If you are building the wing out of balsa, simply cut out the base and tip templates in plywood. Bolt a "sandwich" of eleven balsa sheets in between (size and shape on plans), and carve and sand to shape. Repeat for the other wing half. The tab "feet" on the plywood ribs should be positioned on a flat surface as you tighten up the stack prior to shaping. The tabs keep the wing aligned during construction. After the wing framework and leading and trailing edge top sheeting are completely dry, cut off the tabs and sheet the bottom sides. The ailerons are cut out after sheeting. The tail control surfaces are not sheeted, for scale effect and lightness.

For foolproof canopy mounting, I like to perforate the bottom edge of the canopy with a straight pin, prior to epoxying it in place. Punch holes completely around the canopy, approximately $1/16$ " apart and $1/16$ " away from the edge. The canopy interior can be given a nice scale effect by simply painting the wood with black watercolor. If the canopy is then epoxied in place, the glue penetrates thoroughly into the wood and through the pin holes, to form a very strong bond. This should be done prior to finishing the rest of the plane. I use slow-curing Hobbypoxy II glue for better penetration when attaching the canopy.

I also use this glue in the engine and gas tank compartment, for good wood penetration and excellent fuel-proofing. A nice feature of this design is the isolation of the engine and fuel tank from the airplane interior. A pylon 12-oz. tank slides through the front opening into the tank box, prior to engine installation. The tank and engine installation is an exercise in "tight fit," but is rewarding in looks and operational ease. I have found Du-Bro ball head wrenches invaluable for mounting the 6-32 engine-to-plate and 4-40 plate-to-beam socket head bolts. Be sure to put lock washers beneath the bolt heads. Also epoxy 6-32 blind nuts on the back of the $1/8$ " aluminum engine mounting plate, so that the bolts can be tightened without stripping threads out of the plate.

I couldn't resist building in a "parachute box" behind the wing, just in case the mood strikes me later. It is there, if I want to cut out the trap door and add

the chute. Whether you use it or not, it still adds strength to the fuselage.

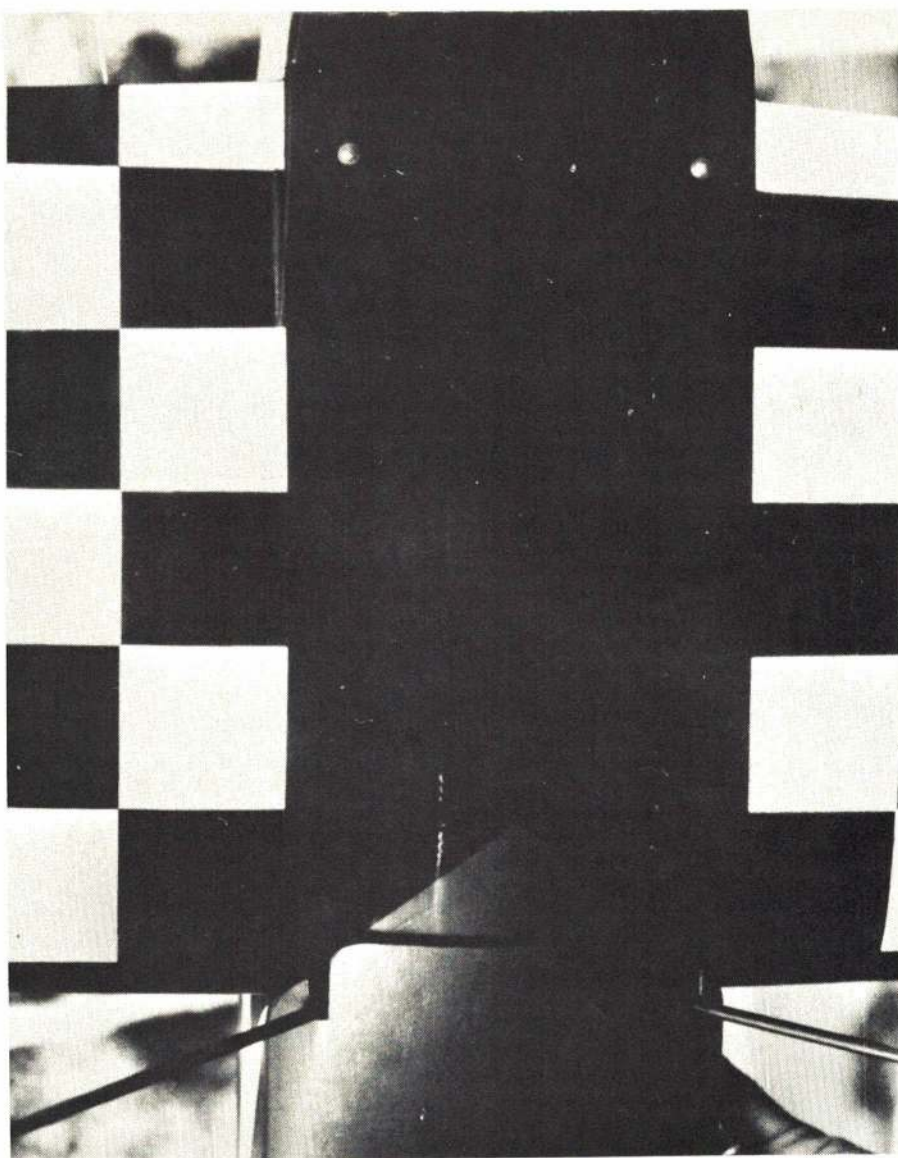
Several steps were taken to lighten the aircraft. Holes were cut in the plywood firewall and covered with balsa (see plans). The maple beams behind the firewall were drilled with a 1/4" bit, on 5/8" centers, for lightness. Regular, instead of low bounce wheels, were used. The lightest weight balsa was used throughout, except in critical areas, such as pushrods, elevator joiner, and 1/8" medium weight fuselage top sheeting and wing spars. Most importantly, the finish is minimal, but adequate.

I used the silk and dope method. Initial preparation was with three coats of clear, followed by silk (not a heavier synthetic). This was followed by four more coats of clear, two coats of color, and one coat of clear. Sanding was done as needed between coats. No sanding sealer was used. Although not as slick as glass, this finish is fuelproof and pleasing to look at. With the engine exhaust pointing down, the plane receives very little of the exhaust residue and, consequently, needs little protection.

After construction, a slight sagging was noted in the top fuselage sheeting behind the cockpit. This has since been obviated by doubling the number of formers in this area on the plans. If you like a heavy finish, however, I can't guarantee that you won't have sags in the top sheeting on a plane of this size. In this case, I suggest you use hard balsa for sheeting or, as I suggested earlier, go to Profoam.

The 3/16" steel music wire landing gear is about right for this size airplane—no chance for weight economy there. Another nice feature of this design is that the plane will sit on its gear with the wing removed. The gear is also easily removable, and will deform after considerable force is applied, with no damage to the plane (this has been field tested by a landing in soft sand).

In spite of its large size, the plane is not particularly expensive, in comparison to the average contemporary 60

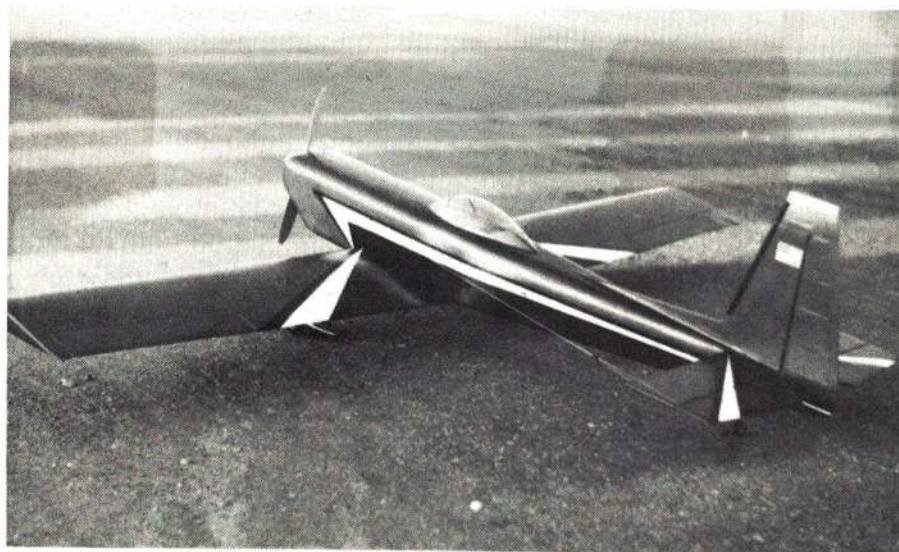


ABOVE: Landing gear fits into the lower nose block. Checkerboard paint scheme on both lower wing and stab adds a nice touch, and aids in flight visibility and orientation. **BELOW:** Author reaches V₃ quickly, to ensure that the plane will clear any obstacles at the edge of the field. The obstruction is a tree some twenty miles away.





ABOVE: The Akromaster rests on the runway after a flight. The whole crew of field foremen from Occidental Petroleum turned out to watch the flying. After all, what's more important, oil or flying? BELOW: Most fliers like a model that looks like a plane. Styled after one of the cleanest full-scale aerobatic ships, the Akromaster excels in eye-appeal.



With moral support from family and friends, the author retrieves a blown landing from that big sand box.



pattern ship. Significant savings have been accomplished by choosing a tail dragger design, instead of three retracts. Also, a homemade plate-type engine mount, a minimum but pleasing finish, homemade 1/4" balsa pushrods, and only a four-channel radio keep costs to a minimum. I buy my castor oil by the gallon, and mix it with methanol (which I obtain free from a local refinery) for further savings. *(Remember, folks, this guy is in an Arab country, thus the refineries—Ed.)* For sport flying, a straight 20% mixture runs just fine in the dual plug ST 71.

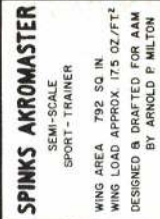
After discussing flying, building, and financial considerations, I would like to touch upon what has been, for me, a significant consideration when building a model of this size—your geographical location. I am a geologist by profession, presently working overseas in Libya. To those in the know, this should be enough said...but let me finish. When I found out I was going overseas, two years ago, I packed my freshly drawn plans, wood, paint, engine, radio, etc., in a large plywood "coffin," which I built as a safe place to store and ship the completed plane. Last year, I built the plane in my spare time in Tripoli. Some construction had to wait for the annual home leave, when I could acquire additional glue (it takes a determined soul over here!).

Finally, the great day arrived, and I (and four carloads of friends with cameras) drove out to a coastal sebkha, or salt flat, for the test flight. The weather was beautiful, and my friends enjoyed the flying. But, as I was putting up the plane, the army arrived and arrested us at bayonet point. We were under suspicion of flying a spy plane and photographing coastal defense installations (which unbeknownst to us were on the other side of some nearby sand dunes). Two carloads of my friends were departing as the army arrived. They missed being shot only because the soldier trying to stop them dropped his rifle clip in the sand. They saw what he was doing and departed at a higher rate of speed. This didn't help our situation, but certainly was the prudent thing for them to do.

After a forced march of about one and a half miles, and a spirited "discussion," which lasted until after dark (I wish I knew Arabic), we were released as friends. In retrospect, you can't blame the soldiers for being suspicious in this part of the world, but it sure can be wearing on a dyed-in-the-wool model airplane nut like me. I really wanted a picture of those bayonets for this article, but it just wasn't an opportune moment.

So much for the local color; now for a resume of how this bird flies. Everything is set up 0-0, with a very slight down-thrust on the engine. Mount your battery to counter the weight of the side-mounted engine. Takeoffs are nothing less than fantastic. Trim in up elevator and hold right rudder to counter torque, while slowly advancing the throttle. The Akromaster tracks as straight as an arrow, because of its free

(Continued on page 108)



Vickers Wellesley

Like the Chipmunk of WWII, this design comes originally from England, was built in Canada, and is introduced to the U.S. This CL semi-scale sport flyer uses plenty of shortcuts to minimize building time. /by Mike Hollison



The semi-scale appearance of the Vickers is very appealing. Using an inexpensive commercial foam wing makes it even more appealing.

When deciding what model airplane to build, you can exercise several options. You can select the design first, then buy the materials needed, or pick a design which can be made from materials at hand. You can also look for a model guaranteed to raise the question at the flying field, "What is it?"

The Vickers Wellesley bomber was a result of the second approach; namely, what plane could I build around the wings of an Eldon Giant Styro-Glider. While the "What is it?" approach was not intended, this particular model seems to raise that question whenever it appears in public!

The full-scale Vickers Wellesley was, in part, the brainchild of Dr. Barnes Wallis. It utilized the geodetic method of airframe construction perfected by him. This technology was later used in the design of the famous Wellington bomber. With a wingspan of 74' 4", and powered by a 925 hp Bristol Pegasus en-

gine, it proved ideal for the RAF Long-Range Development Unit. In 1938, the RAF entered three Wellesleys in a distance attempt for a 7162 mile journey from Great Britain to Australia. Two of them reached Darwin, Australia on November 7, having completed the distance in just over 48 hours.

Obsolete as a bomber by the beginning of the war, the Wellesley nevertheless saw active service in that very role against the Italian forces in East Africa and the Sudan, and was even credited with several "kills" against enemy aircraft!

CONSTRUCTION

Begin with the easiest part first—the wing. Should a Styro-Glider kit not be handy, scratch-build the wing from a piece of foam, using the standard hot-wire cutting method. Separate the two wing panels and incorporate 2" of dihedral under each tip when re-joining. The

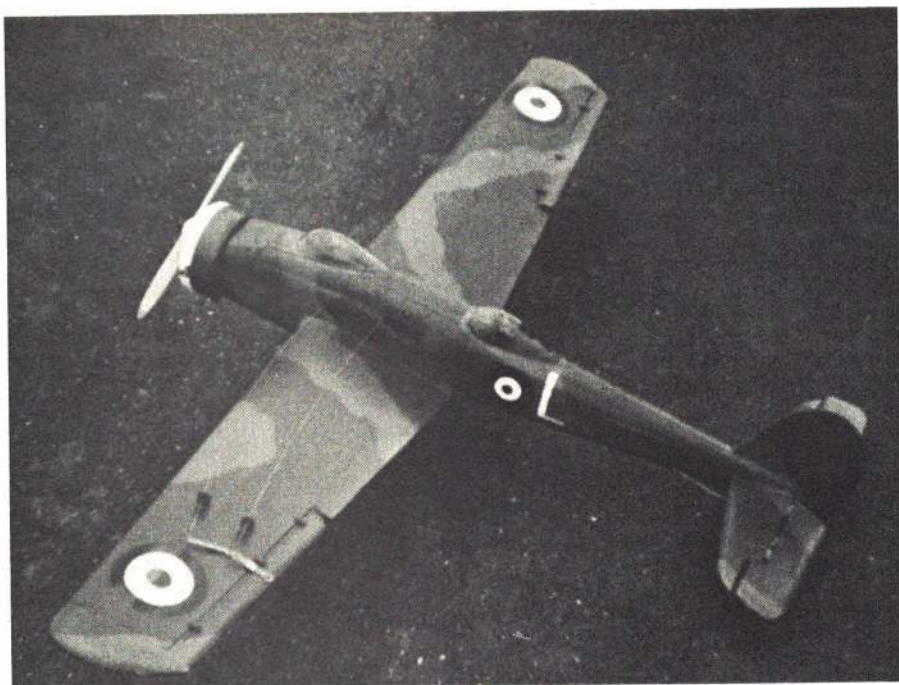
Styro-Glider wings must be shortened from their standard 44" span to 38", and slots for plywood and balsa bracing spars cut in each panel. Each half should also be slotted for the spruce strengthening spars top and bottom, and at the ends for the balsa tips. The ailerons should also be cut out and ready for covering. Sew and epoxy the 3/32" wire landing gear to the ply spar. Then glue these into the wing panels. Add the rear balsa spar. (It is important to remember not to use balsa cements on polystyrene foam. When epoxy is not specifically recommended, use Titebond or a similar product.) Add Titebond liberally to the center section joints, filling in all the gaps, and leave the wing to dry out overnight.

The top and bottom spars are glued in next, and the whole wing, including the ailerons, coated with Titebond (or a foam core contact cement), and sheeted with balsa, 1/16" on the bottom, 1/32" on top. Carve the wingtips from medium balsa, and glue them, as well as the ailerons, to the wing. Angle the outboard aileron up 8°, the inboard 8° down. This will cause the plane to bank out from the center of the circle, and reduce the possibility of any crash through loss of line tension. Follow this same procedure if making the wing from scratch.

This completes the wing structure and we can turn our attention to the fuselage, which is built in two halves. First, drill the ply engine mount for the tank overflow vent. Epoxy the mounts to former F1, which should be drilled to take the tank feed vent. Epoxy the tank, complete with plastic tubing, immediately behind F1, then cement F2 in place. Next, cut and carve the top and bottom fuselage blocks, and two side panels, from lightweight balsa. Remember to notch the rear of each block to accept the aft fuselage spars, and drill each block for the tank tubing. I would advise that all these be cut larger than shown, to allow for sanding.

Epoxy the engine mounts to the fuselage sides and add former F3; then glue the wing to the bottom fuselage block. Using plenty of Titebond, attach the wing to the fuselage sides and bulkheads, adding the balsa cross braces inside to help strengthen the joint. Fill in any gaps with scrap balsa and allow to dry.

Fix in the bellcrank, pushrod, and lead out wires, and begin the rear fuselage half. This is done by epoxying the top and bottom spars to formers F4 and F5. Sew and epoxy the tail-wheel wire to F6 and cement this in place. Then, build up the left side of the fuselage with 1/8" sq. stringers, as shown on the plan. Epoxy the rear fuselage section to the front, and check the movement of the pushrod through F4, F5, and out through the fuselage side. Build up the starboard side with stringers as before. Sand the blocks flush to the rear section, and score in all panel details with an X-acto knife. Cover the built-up fuselage with heavyweight tissue, water shrink, and apply three coats of clear dope.



The Wellesley has well-balanced areas and moments for stable sport flying. Note the aileron deflection, to keep the plane solidly at the outside of the circle.

Cut out the fin, rudder, tailplane, gear doors, and tail block, and treat with three coats of balsa filler. The cowl is made by wrapping a strip of 1/32" balsa around two rings of 1/4" hard balsa, as shown. Leave the underside open to accommodate the engine, and cut a hole for the needle valve. When the plane is completed, simply spot-glue the cowl to the fuselage so that it can be removed

easily. Carve the tail block from scrap balsa, and slide the stabilizer, with the elevator already hinged, onto the block. Fit the tail unit to the fuselage temporarily with pins and a rubber band. Bolt the engine in place, slip the wheels onto the landing gear and check the balance. The CG should be just behind the front lead-out wire. If the model is nose-heavy, add a nut and bolt or similar ballast to the tail. Cut the pushrod to the correct length, mark the position of the control horn on the elevator, and make a slit for the 1/16" ply horn. Cement the fin, rudder, and stabilizer to the block; slide the pushrod onto the control horn, and epoxy the tail unit to the fuselage. This completes the model, except for wheels, cockpits, and other sundry items.

FINISHING

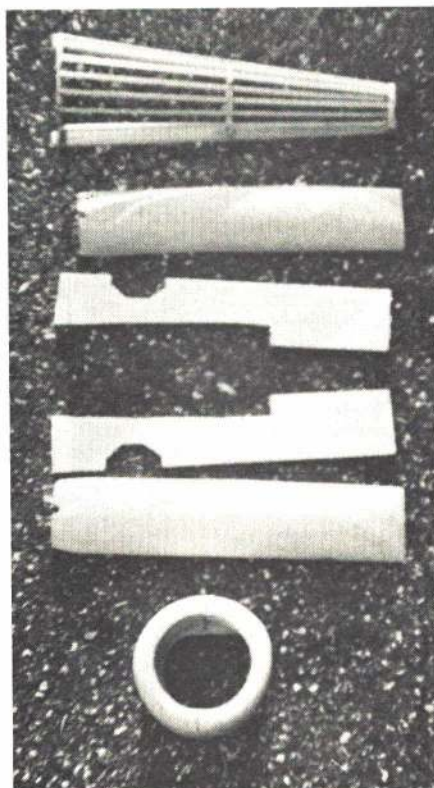
Apply three coats of balsa filler to all balsa surfaces, and then three coats of colored dope, sanding between each one. The cockpit areas are painted matt black, and all top surfaces are army olive drab and camouflage tan. The undersurfaces are painted flat black. The cowl ring is flat white, as is the lettering beneath the wing.

When all painting is completed, add the pilot, navigator, gear doors and cockpits. Epoxy the lead out wire guide tabs to the wing, and attach the wheels. Stick some RAF roundels to the upper surfaces, and your Wellesley bomber is ready for action.

FLYING

The handling characteristics of this model are excellent, and the takeoff run can be as long as you want it. The functional ailerons ensure line tension, even in windy conditions. Landings are fast, so be ready to apply plenty of up elevator just before touchdown.

(Plans on following page)



The nose area items are simple blocks and sheets. A stringered turtledeck attaches to form the aft section of the fuselage.

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VECO 61 RC
DON JEHLIK



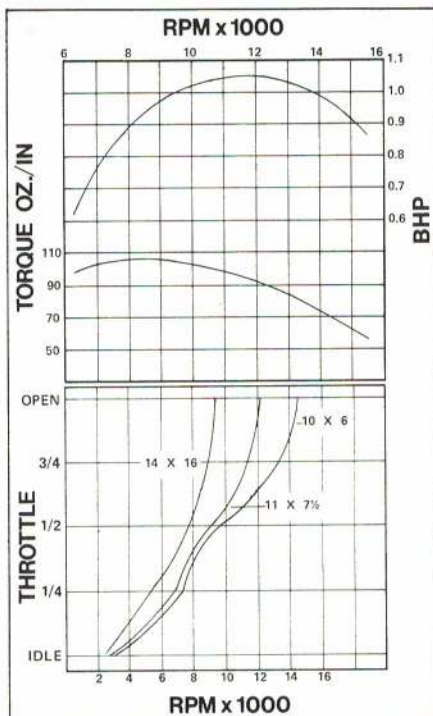
Subject of this test is the ever popular Veco 61 RC. Test engine came equipped with Perry carb and flow-through muffler with pressure tap for the fuel tank.

Internally, this engine has a chrome plated sleeve, single ring baffled piston with two bypass transfer holes drilled in the side of the piston skirt. This is a feature I have long favored. I find that engines run with mufflers have pretty hot pistons. The transfer ports in the piston pass some of the fresh (and cool) fuel-air mixture through the inside of the piston and help to keep it cool.

Some thoughts on chromed sleeves. Back in the Dooling 29 and McCoy 60 speed days, I learned that chrome sleeves stay round! I remember each time we got a real lean run on a standard sleeve, it warped and piston/sleeve had to be replaced. I don't remember why I did it, but I had Franny Wolf chrome some sleeves for me. When I had my first real lean run on the McCoy 60, I thought, there it goes, and the bucks for the chrome too. Didn't happen. The engine ran six years with the same piston, rings, and sleeve. It ran faster each year. The sleeve stayed round even though it turned blue from the top almost to the bottom. When old time speed gets started, I'll pull that old McCoy out and beat Bob Lauderdale, finally.

Back to the Veco. The ring seal never reached the point where the engine flipped over with a pop. I didn't have real problems starting it, but I would use a starter next time around. The engine wanted to cool off before the next hand start. The Perry carb works well. The engine idled between 2500 and 3000 on any normal prop.

(Continued on page 107)



THE WAYFARER
C. PAT MURPHY



This kit has one of the most complete, step-by-step building instructions I have ever seen in a model airplane kit. I did have to use a metric scale in order to determine what piece of wood was being referred to in the instructions or on the plans. The instructions come printed in French, German and English. The plane went together quite easily and very fast.

The plans included in the kit show real good detail and seem to be dimensionally correct. The wood was well selected and of a very high quality. The manufacturer used both hand sawing and die cutting to produce this kit. The sawn parts fit and the die cutting was very clean with no smashing of those parts.

A hardware package is included and contains the fuel system, wheels and Halco gears, tail wheel assembly with wheel, control horns, and assorted bolts and nuts that are required in the construction of the Wayfarer. Only glue, motor and motor mount, plus covering and finishing materials, need be supplied. Silk-span Coverite and Sig dope were used to cover and finish this plane, and I found they gave a very pleasing finish.

This is one of the easiest handling conventional geared airplanes I have ever built. It is almost as easy to take off and land as a trike geared model. The Wayfarer will perform all the Class C maneuvers and most of the maneuvers in the new Class D. It will snap, spin and recover at a very low altitude as well as many other types of show maneuvers. It will fly very slowly, retaining aileron control, with little or no tendency to drop a wing.

I made only one deviation from the instructions: I glued in doubler f.6 with epoxy rather than the suggested Titebond glue (Titebond would make the fuselage sides and doublers want to warp). I also built the wings on an A-Justo-Jig.

With a good 40 size engine, the Wayfarer is a very gentle kitten, and anyone with some proportional flying experience (second or third plane) would have absolutely no problem flying this bird. With a good 60, the Wayfarer becomes a tiger, able and willing to do the bidding of the experienced pilot who wants to tie a knot in the tail of the world.

Specifications: Configuration—Biplane. Wing area—832 sq. inches. Wingspan—52". Engine size—40-60. Weight—6 lb. 8 oz. (60 engine). Imported by—Tenco International, P.O. Box 1987, Palm Springs, Calif. 92262.



SPERRY MESSENGER
C. PAT MURPHY



The Sperry (M-1) Messenger was designed to be a scout vehicle, which was similar in use to a motorcycle. They were to be able to take off and land from almost any place. Builder Lawrence Sperry's M-1 landed and took off from the east parking lot of the U.S. Capitol. The Army tested the Messenger as a parasite aircraft, hung from its blimp, TC3. The Navy converted several of the Messengers into radio-controlled drones, the world's first RC aircraft. These are some of the reasons why I wanted to review this particular model, "the cutest plane in the Army."

For the modeler who wants to build a fun airplane that can effectively compete in Sport Scale, this is a great model and Jack Stafford offers a great kit. It is comprised of a good lightweight diecut balsa, bandsawed plywood with a very good set of plans and instruction manual, including three-view line drawings for scale presentation. Parts that are not included in the kit are designated by name and can be obtained from any good hobby shop. The nose cow! included in the kit is of a heavy gauge plastic and is easy to fit to the fuselage and to the engine.

The most difficult construction on the whole plane is bending the landing gear and cabane struts. The real plane was covered with plywood and the kit is covered with balsa, so the scale finish is easy to simulate. After sanding the plane, I covered with Silk Spun Coverite to get a good paint base. The light khaki (very light olive drab) was mixed from Sig dope, using their olive drab to start, then mixing in forest green, white and chocolate brown to achieve the color that was more or less standard in the 1920s. Williams Bros. wheels and cylinder heads are used as shown on the plans. A scale looking prop was made from a 13 x 4 TF Power Prop (this is scale length).

The plane is powered by a Supertigre 46 (Du-Bro Muf-El-Aire) and a 10 x 6 prop for flying. This little plane is a joy to see and a thrill to fly. Maneuvers can be executed in a very scale manner and should garner a lot of flying points. It does require that you practice a bit to be able to make good takeoffs and landings. This is a plane with which you can have a love affair. Manufactured by Jack Stafford Models, 12111 Beatrice St., Culver City, Calif. 90203.

Specifications: Wingspan—44 in. Area—704 sq. in. Chord—8 in. Weight—5 lb. 4 oz. ready to fly Engine—40-60.

**SUPERTIGRE 60 RC BLUEHEAD
WITH MACS MUFFLER
DON JEHLIK**



After doing the test on this engine, I'm not sure I can add much to what must already be known about it. Vibration levels are remarkably low. It just sits there and runs, real smooth. The carburetor is the easiest adjusting carb of all 60's I've tested so far. Idle is slow, and positive.

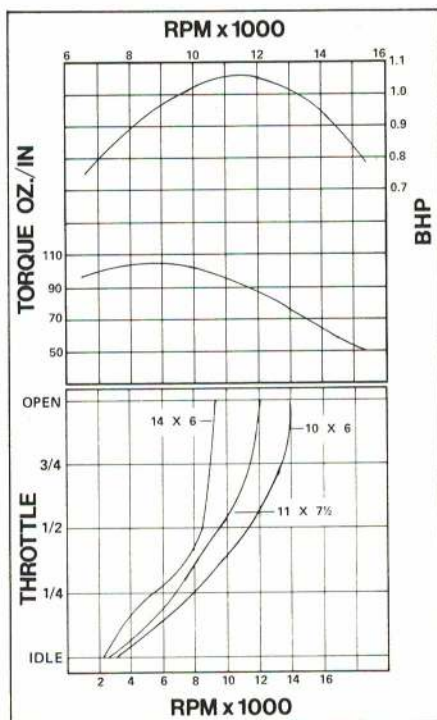
Inside, the engine has a chromed sleeve and single ring baffle piston. The piston does not have transfer ports drilled in the skirt and it began to discolor during the test. Discoloration is caused by piston heat and oil heated to the point where it literally bakes on the metal. Now, not all oils will discolor or bake on at normal engine temperatures. Castor oil will do it; most of the synthetic oils now in use will not. I do not believe synthetic oils do a complete lubricating job, in terms of engine life. I prefer a fuel with a minimum of 5% castor oil.

Test engine had a very good compression seal. It started easily, hot or cold. A good prime in the intake is all that's needed when cold—less when hot.

The reasons for testing the carburetor at different throttle settings and props is to see how it will perform under different engine load and flow conditions. The largest prop used, 14 x 6, and smallest, 10 x 6, represent the extreme in rpm range the engine will probably run in flight. The carburetor function was especially smooth on the 10 x 6 prop.

I didn't have a Supertigre muffler available with this engine. The Macs muffler used in the test is of flow-through design. The large venturi front extends about 20% into the muffler

(Continued on page 108)



**PRO-LINE CHALLENGER
FRED MARKS**



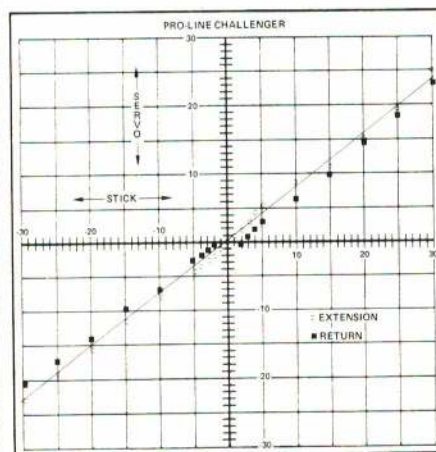
THE SYSTEM: The Challenger is a five-channel system that features the use of D&R open gimbal sticks, rather powerful servos, and a commutated integrated circuit encoder. It is the Pro-Line entry into the popular "sport type" system competition and is priced somewhat lower than the all-out Competition Six system. Any Pro-Line servo or 180° retract servo may be used for the fifth channel. The test set was on the 72.320 MHz frequency.

TRANSMITTER: The transmitter features a new commutated IC encoder that produces five-channel control. Three transistors in a free-running multivibrator circuit (one transistor is an input buffer) set the synchronization pause, control pulse width, and modulation pulse width. Just one critical component, a high stability Mylar capacitor, is required. The free-running multi clocks an eight-bit shift register to sequence pulse width control between four channel control pots. RF boards for the transmitter are interchangeable plug-in units. The charger for the transmitter and airborne units is of the resistor voltage-dropping type and is mounted on the encoder board. The Challenger retains a buddy box capability.

RECEIVER: Receiver circuitry is the same as for the Competition Six, reviewed recently, except that it is a simple deck receiver/decoder board. Change-frequency is not a feature of the total system. The receiver uses an FET for RF amplification in the double-tuned front end. Four IF transformers are used. We ran some tests of this receiver using a Hewlett Packard Model 8640B signal generator and found the receiver has an exceptionally low self-noise level. As signal level decreases, there is no perceptible increase in noise level at the detector; the output pulses simply recede to the DC base level.

SERVOs: The PLS-15 (Kraft KPS-15 mechanism) is the standard servo for the Challenger. The amplifier is essentially the same as for the Competition Six. A Texas Instruments IC and two external PNP transistors do the work. Fourteen external components are used. It is a three-wire amplifier. Output for the servo is rotary only. Servo current drain

(Continued on page 108)



**HOBIE HAWK GLIDER
AAM STAFF**



Ever envisioned a sporty soarer with top-notch performance, which is ready and waiting for you to drop your radio into? Stop dreaming. Miracles do happen. This one was a successful catamaran and surfboard manufacturer named Hobie Alter who applied innovative construction techniques to create a totally new look in gliders.

The Hobie Hawk utilizes combinations of materials to create a virtually indestructible, eye-appealing design. The wings feature an elliptical dihedral molded structure of 1/32 and 1/64" ply which cover a special high density, low weight foam core. The leading edge is spruce; wing is precovered with MonoKote. The stab and fin are of identical structure.

The fuselage consists of three basic pieces—each of different materials. The nose cone, which ends near the CG, is rotationally molded polyethylene. Tailboom is of six-layer epoxy fiberglass. The tail cone is molded ABS. All this is pre-painted with a very nice finish. Pushrods are all set, towhook is installed, and everything is set to go. If that doesn't make even the most die-hard powered plane enthusiast's thumbs twitch, an explanation of how this machine performs follows.

The first day the Hobie Hawk was to fly, the area (usually jammed with soaring birds) was clear as a bell. Why? A simple matter of 35 mph winds with gusts up to 45—certainly no day for powered ships. But deadlines, a sunny day and a severe case of twitching thumbs provided inspiration to throw the ship off a Maryland mountainside. Crazy? Only until it was seen how well this bird handles high winds. The 37 oz. airframe penetrated the winds as well as could be expected, and within minutes it was high in the sky. Loops, rolls, high speed dives, all created flight loads the likes of a pylon racer, without any structural damage. All mouths were wide open. The ship has since proven itself to be a very capable light wind soarer, although it seems to operate best in winds over 5 mph.

Two versions of the Hawk are available: the built-up version mentioned, and a kit form which requires painting and covering. The kit form took about 12 hours to complete. Sounds like a long time? It is, but then those wings aren't the simplest things to MonoKote. Be sure to watch the washout in the tips, and make certain the covering has adhered well to all those ribs. Don't forget to exercise caution when applying heat to the wing—an excess can cause a shrunken rib or misshapen leading or trailing edge. Both a heat gun and iron were used to accomplish the covering. Careful use of the iron results in a beautiful scratch-free finish. The fuselage comes pre-primed and was sanded down a bit to remove the pinholes in the surface. A rubbed-out dope finish completed the fuse and the radio was installed. If you've got one of the old style flat battery packs, you better think about replacing it with an oval or square type because of the skinny fuse. Also, servos can't be much larger than the KPS-10 size.

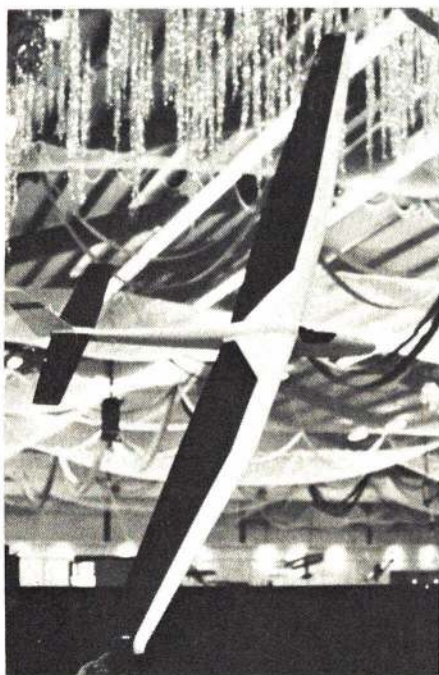
Take your time finishing the kit because this is a bird that you'll probably have around for a long time. During flight testing (complete with stalled landings and a couple of violent cartwheels) the Hobie Hawk came out unscathed. Its strength is unequalled by any glider available and it sports performance equal to many full competition machines. Try one—find out how much fun glider flying really is. And as they say on the West Coast: Have a Hobie Day!

Specifications: Wingspan—99 in. Area—590 sq. in. Flying weight—37 oz.

TELL THEM YOU SAW IT IN—

NEW PRODUCTS CHECKLIST

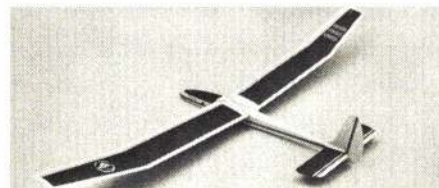
ERIC W. MEYERS



Craft-Air/Leo. Claimed to be the world's largest kitted model airplane, this ship spans over 12½' with 2100 sq. inches of lifting surfaces. This 7 lb. minimum weight means about 8 oz. per sq. foot loading. All-balsa ship has many unique construction techniques. Design was selected by Jerry Krainock for an attempted cross-country world record. \$99.95. Craft-Air Products, 5651 Kelvin Ave., Woodland Hills, Calif. 91364.



Sterling/Gazariator. Big bird with a 68" span and 800 sq. inches of area, this ship is for the sport flier looking for a large plane. Sort of a "Super Fledgling," the balsa construction goes quickly. For four-channel systems. Ailerons are tapered and full length for easy installation. Sterling Models, Inc., Belfield and Wister Streets, Philadelphia, Penn. 19144.



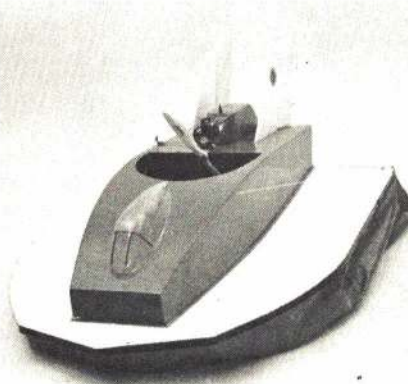
Airtronics/Super Questor. Featuring typical Airtronics machined balsa parts, this new 80" span soarer is easy to build for experts and novices alike. 20 to 24 oz. flying weight for high performance. Model can be built with either V- or polyhedral-type wing dihedral. Airtronics, P.O. Box 132, Sierra Madre, Calif. 91024.



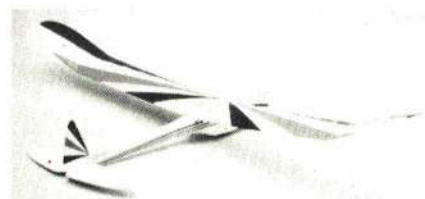
Aerotique/Cap & Protector. Safety conscious manufacturer is bringing out this safety cap which is great for all types of fliers, especially racers. Helmets are \$3.75 each. The hearing protector kit fits on the cap and swings up and out of way when not in use. A necessary item to preserve your ears. \$11.50. Aerotique, 19900 Ingersoll Dr., Rocky River, Ohio 44116.



Midwest/Strikemaster. Jim Newman sport design has a thick, forgiving airfoil for good slow speed flight stability. Model has shoulder wing configuration, trike landing gear for rough field operation. Span is 55"; for 19 to 45 power. Model can be finished in a variety of configurations for a semi-stand-off scale flair. Balsa fuse, foam wing. \$42.95. Midwest Products Co., 400 South Indiana St., Hobart, Ind. 46342.



Venture/XR-1 Hovercraft. A unique aircraft, this 50-powered hovercraft floats five inches off the ground on an air cushion so it will travel over water, ice, land—any reasonably smooth surface. Model has ply parts and foam for flotation during water use. For two-channel radios—rudder and motor controls. For 35- to 56-size engines. Venture Aero-Marine, Box 5273, Akron, Ohio 44313.



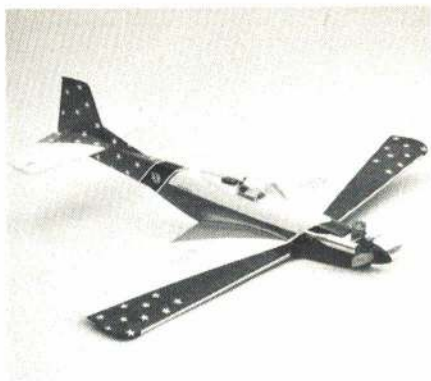
House of Balsa/Larger Version. Updated version called the Nomad Two, this 61" span ship carries all the fine flying characteristics of its smaller counterpart. Plane uses two-channel systems and it is suitable for slope, thermal or powered soaring. All-balsa construction—one-piece fuselage sides. Fixed or removable power pod uses an 020 engine. \$19.95. House of Balsa, 2814 E. 56th Way, Long Beach, Calif. 90805.



D&B/P-40. One in a series of WWII stand-off scale ships, this P-40 kit is very complete. All those hard-to-find items such as wheels, spinner, interior detail, cannons, accessories are all provided. All items such as fairings, lights, etc. are molded plastic to give the highest static points. All pushrods and hardware are included. Plane has flaps, sliding canopy. Fiberglass fuselage and foam wing. 60 engines. \$119.95. D&B Model Aircraft, 31 College Ln., Dartmouth, Mass. 02747.



Maintenance/Ultra Cleaner. An efficient, easy way to clean engine parts, tools, hardware, etc. is with an ultrasonic cleaner. This Bransononic unit is compact and its dish is just the right size for modeling uses. Using a high frequency cleaning action, even crevices can be thoroughly cleaned. Unit has all solid state circuitry. \$80.00. Maintenance Engineering Co., Inc., 41 Norwood Terrace, Trumbull, Conn. 06611.



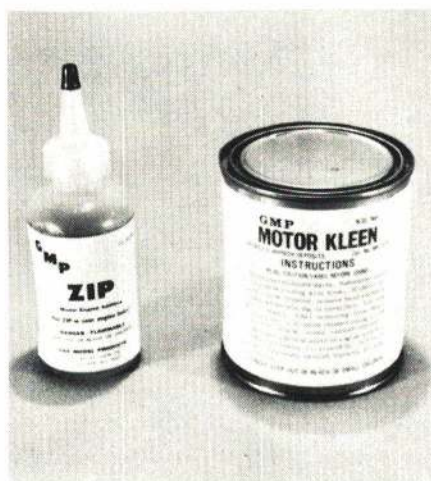
Southern R/C/Mustang-X. Economical, semi-scale pattern or sport ship uses a 40-size engine, yet it will equal performance achieved by many larger ships. Kit features pre-cut balsa and ply parts with foam wing cores. 1/16" wing skins, Sorghum cement and hardware package are included. 55" wingspan, 502 sq. in. of area. \$59.95. Southern R/C Products, Inc., 8685 North Palafax Hwy., Pensacola, Fla. 32504.



Dave Platt Models/T28-B. Many features such as special airfoil and washout, long tail moment for CG tolerance, tricycle landing gear and large wing area have been combined to make this design as easy to fly as its prototype. The stand-off scale ship accepts retracts and flaps for maximum scale effect. Kit is all-balsa, includes decal sheet set and hardwood. 65" span, 700 sq. inches of area. Dave Platt Models, Inc., 1300C West McNab Rd., Ft. Lauderdale, Fla. 33309.



Rhom/New Muffler Concept. Makers of the popular Rom-Air retracts, Rhom has a new muffler which takes no power from an engine, yet silences those harsh tones effectively. Unit features pressure takeoff, heat sink manifold and slim profile for the least possible drag. Designed to strap or screw on to several of the most popular 60-size engines. \$9.95. Rhom Products Manufacturing Corp., 924 65th St., Brooklyn, N.Y. 11219.



GMP/Zip & Motor Kleen. A new engine additive, Zip will reduce carbon build-up and helps to eliminate rust and corrosion. Four-oz. bottle, \$.98. Motor Kleen is a cleaner which helps remove varnish from cylinder head and crankcase. Soak dirty parts, then scrub away varnish deposits with a stiff brush and water. 16-oz. can, \$1.49. Gas Model Products, 110 Valley View, Southgate, Ky. 41071.



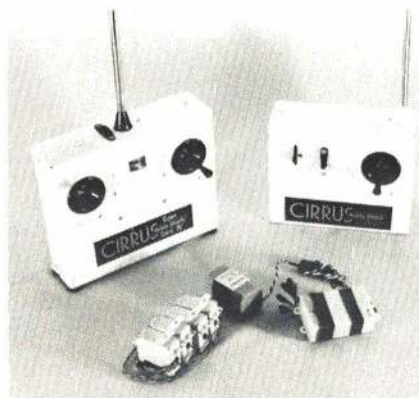
Top Flite/P47D. Large, 700 sq. inch wing area combined with low weight should help to make this new bird from Top Flite a fine flier. WWII stand-off scale ship has a unique formed balsa skin fuselage top to keep weight of the "Jug" down to 7 1/2 lb. with retracts. Three-piece cowl is plastic. Ship looks very good. 63" span; for 60 engines. Top Flite Models, Inc., 2635 South Wabash, Chicago, Ill. 60616.



Cox/Super Stunter. Fantastic ready-to-fly UC stunt ship is 049-powered and will fly the complete pattern. Model uses new construction techniques such as a molded foam sheet wing and impact resistant styrene fuselage to help keep weight down and strength up. Span of this semi-scale Messerschmitt Bf-109E is 31". Plane has a special tank set up for inverted flying. L.M. Cox Manufacturing Co., 1505 E. Warner Ave., Santa Ana, Calif. 92705.



Bridi Hobby/Kaos Jr. 52" span Kaos is mid-size for 35 to 49 engines. Good quality, all-balsa kit has simple instructions for easy building. All-up weight is approximately five lb. A fun airplane for the sport flier with plenty of pep for aerobatics. Bridi Hobby Enterprises, 1611 E. Sandison St., Wilmington, Calif. 90744.



Hobby Shack/Sport Systems. New Sport three- and four-channel sets are great for the performance-minded economy fliers. The Super Sport IV radio has Tx, Rx, four ultra-light IC servos and complete NiCad battery packs. 27 or 72 MHz. \$189.00. Cirrus Sport III—three-channel system comes with Tx, Rx, two mini servos, dry battery box and switch. \$89.99; add \$10.00 for 72 MHz. Transmitter stick tension is adjustable on both sets. Hobby Shack, 6475 Knott Ave., Buena Park, Calif. 90620.



Pierce Aero/Arrow Glider. A versatile design, this 76" span glider is an ideal introductory kit for the beginner, yet its advanced design will appeal to the performance-minded expert. Kit contains all components needed to complete the ship except for RC gear, covering material and glue. Balsa and ply parts are precision cut for ease of assembly. For two-channel radios. Flying weight is 24 oz., and wing area is 500 sq. inches. \$29.95. Pierce Aero Co., 9626 Jellico Ave., Northridge, Calif. 91324.

getting started in R/C

SEVENTIETH IN A SERIES

BUYING USED EQUIPMENT. / by Jim McNerney

Many of you just starting in RC, particularly you younger types, are looking to buy in as cheaply as possible. By the standards of just a few years ago, new radio equipment is relatively inexpensive. Full four- to eight-channel equipment is available for under \$300. Two- and three-function systems are available for around \$100. Because new equipment is available at a fairly reasonable cost, used equipment prices have dropped steadily. There are bargains to be had in used gear. There are, however, many pitfalls in the process of acquiring used gear. We'll try to point out some of them for you.

Modern digital equipment started to come into prominence in the mid-1960s. Up to that time, the field was dominated by reed relay, analog, pulse and escapement systems. The reason most of these systems are no longer produced is that digital systems are more reliable, smoother, more compact and easy to fly. A notable exception is the pulse rudder system which is still very popular for small, lightweight birds.

If you're really serious about learning to fly RC, stay away from the old reeds, analogs, Galloping Ghosts, Kicking Ducks, etc. Some are collectors' items, like a Denny Mite engine. Some are fun to tinker with. But they will drive a serious novice up the wall. Schematics and parts are nonexistent, and it's tough to find an old-timer anymore who knows just where to kick it to get it started. The same is true of some of the earlier proportional sets, such as the Digi-Trio, F & M and Digicon systems. If it's a well-known make, like Citizen-Ship, Kraft, Logictrol, Pro-Line, Royal, World Engines, etc., some parts may still be available from the manufacturer. You might write the manufacturer and identify the make, model and serial number of the

transmitter, type of receiver and servos. Ask him for schematics and a current parts list.

Before you buy used equipment, it should be examined and tested by a competent technician. The most uncertain used equipment is that which was built from a kit. You are not only faced with whatever hard use the equipment has had in a plane, boat or car, but also the uncertainties of construction, depending on the skill and precision (or lack of it) of the original builder.

Depending on the age and condition of the RC gear, some probable candidates for replacement parts are plugs and pigtails, receiver, antennae, batteries, feedback pots or capacitors, and servo gears. These may not require wholesale replacement, but should be examined and tested thoroughly.

Don't buy a "mixed bag" of stuff loosely defined as an RC system. Some people scrape together odds and ends from various systems and try to unload them as a set of gear. Besides all the obvious horrors such a system conjures up, there are some more insidious things, such as noisy servos feeding back into an unfiltered receiver and high drain system with low capacity battery.

If you are in doubt about a used system, try to get advice from a knowledgeable RCer, one that is still actively flying. Ask the prospective seller for a demonstration—in *his* airplane. Have the system checked, and find out how much it will cost to put it in top working order. Request that this amount be deducted from the purchase price.

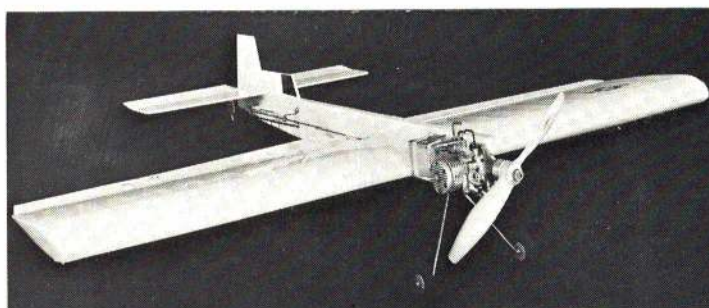
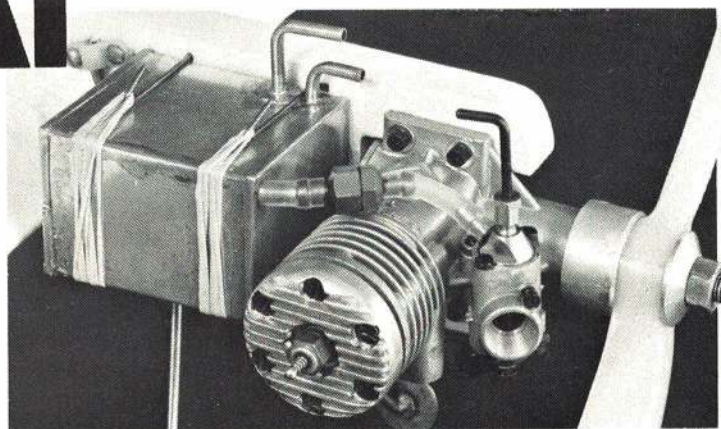
But just remember that no guarantee comes with a used set. So if you go out and prang your brand-new model, don't go running back to the guy you bought it from. Buying a used system is a calculated risk. But if you use the tips we've supplied, the risk will be minimal.

SUPERTIGRE COMBAT



Supertigre ST-35 C r/c \$29.98

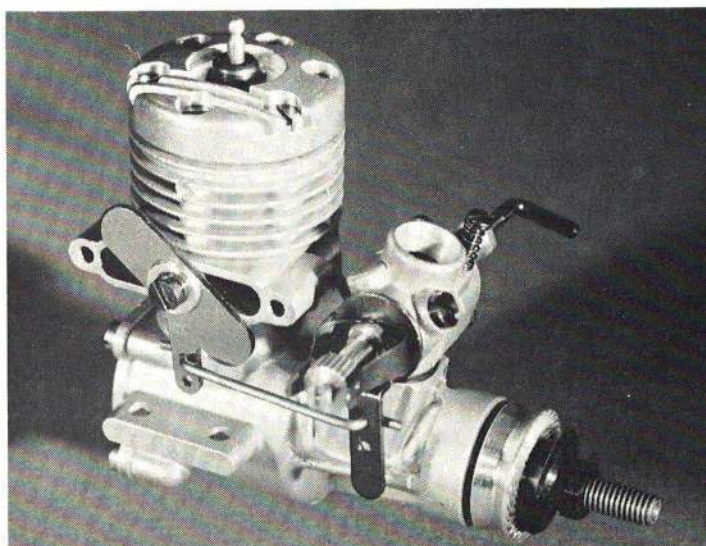
We are expecting a shipment of ST 35 Combat R/C's in from Italy in June of 1974. We have received these engines in the past equipped with throttles. This engine was used at the 1973 Nationals in the Profile Navy Carrier event. This engine was used to take the first five places at the '73 Nats. Harry Higley's plane pictured on right took 1st place. The rules for Profile Navy Carrier demand the use of a plane bearing engine like the ST 35C. This engine also features a flat top piston with aerodynamic porting and a squish band head. The Navy Carrier Profile event is very popular because the planes are inexpensive, costing about \$60.00. The event is easy and informal and a model like this will usually last for several years. Judging is done on both high and low speed. These speeds range from 85 mph on the high side to as low as 13 mph on the low side. Price—\$29.98. ST-35-C-R/C



HARRY HIGLEY'S 1ST PLACE 73 NATS WINNER

Supertigre G.15 F.I. r/c

We are still receiving shipments of the G.15 twin ball bearing flat piston Supertigre engine. Some of these come through with throttles and are used in quarter midget R/C pylon racing. The engine is also popular in U/Control Goodyear without the throttle, of course. Price with throttle \$31.98. Price less throttle \$27.98.



SUPERTIGRE G.15 FI R/C

Note: G-60 FI R/C price increase to \$74.95

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SIG SCALE PIPE



KIT RC-3

\$26⁹⁵

71" Wingspan

Engines: .19-.35

FEATURING A ONE-PIECE WING

A high value kit of one of the most popular scale models ever produced. Built up balsa construction produces a strong structure without excess weight. Light wing loading aids flying performance and stability. Without doubt the Piper J-3 was the most popular airplane ever manufactured. The design is nearly perfect for R/C and makes a beautiful airplane that is easy to fly.

Maxey Hester's World-Famous RYAN ST



KIT RC-27

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WINNER!!!

1st Place Non-Military Scale Toledo
3rd Place R/C Scale 1972 World Ch
1st Place R/C Scale 1971 Nationals
3rd Place C/L Scale 1971 Nationals
2nd Place R/C Scale 1970 World Ch

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Forty-Three Formed Plastic Parts
Two 13-1/2" x 18" 3-View Drawings
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Die-Cut Formers and Ribs
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Big Instruction Book
Partially Shaped Fuselage Sides
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New Type, Re
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Plywood, Pla
Quality Sig Ba
Shaped and N
Flap P

An Exact Scale Model of Jon Gos

KITS FOR SPORT OR COMPETITION

ER J-3 CUB



2" Scale

Die-Cut Sig Balsa and Plywood
Full-Size Detailed Plans
Die-Cut Windshield
Trademark and Number Decals
Built-Up Balsa Construction
Removable Wing Struts
Molded Nylon Control Hinges
New One-piece Wing
Stable Design
Molded Engine Cowling
Formed Landing Gear
Aluminum Engine Mounts

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ENGINE .60

WINGSPAN 72"

do Show 1974 By ED WISSER
Championships By MAXEY HESTER
als By MAXEY HESTER
als By MIKE STOTT
Championships By MAXEY HESTER

Kit Features

, Realistic Appearing Instrument Rings
nt 37" x 49" Construction Drawings
Plastic, Hardwood, Hardware, etc.
g Balsa for Structure and Planking
nd Notched Trailing Edge, Aileron and
ap Parts

SIG

Gosney's Aerobatic RYAN

KWIK BILT*

P-51 MUSTANG

Designed By Mike Stott

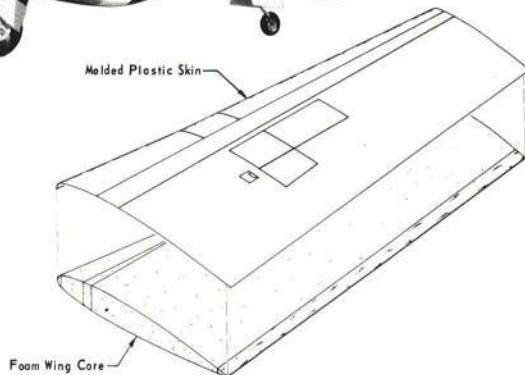
ENGINES: .45-.60
WINGSPAN 64"
WING AREA 700 Sq. In.
WEIGHT 7 Lbs.

KIT KBRC-2

\$4250

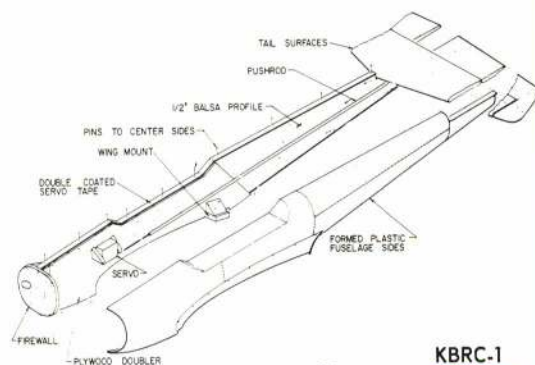
KWIK BILT KIT FEATURES:

Precision-Cut Foam Wing Core
Rugged Plastic Cowling
Clear Canopy With Framing
Formed Plastic Wing Tips
Solid Balsa Internal Profile
Sheet Balsa Tail Surfaces
Pre-Bent Torsion-Bar Landing Gear
Decorative Decal Sheet
Step-By-Step Instructions
SIG Quality Balsa and Plywood
Formed Plastic Fuselage Halves
HARDWARE PACK
Molded Nylon Control Hinges
Molded Nylon Control Horns
Tuf-Steel R/C Links
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P-51 Has Molded Plastic Wing Skins

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*Patent 3699706
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FROM RUSSIA WITH LOVE...



Mr. Polikarpov's Short Little Ugly Fella

by Patricia T. Groves

On December 31, 1933, Valerii P. Chkalov, a well-seasoned, skilled test pilot, climbed into a stubby-looking machine prepared, one hopes, for the thrill of his life.

With enormous wing roots fairing into a barrel-shaped fuselage, closed cockpit and retract gear, it had the racy "flying engine" look that was so popular with speed demons of the Thirties.

For Nikolai N. Polikarpov and the Polikarpov design team, this airplane was a more radical departure in Soviet aircraft design, and from the onset, it showed potential for future development. Eventually, it would go through 24 different variants until production ceased in 1940.¹

In its lifetime, although it would be called a variety of names—depending on *who* was on *which* side of the trigger—its official designation was simply I-16. (I-16 translating to *Istrebitel*, meaning single engine fighter, of the 16th military type considered. Up to 1940, Soviet military aircraft were labeled according to their operational purpose. From 1940, after their designer or design group.)

Of mixed wood and metal construction, the prototype had a maximum takeoff weight of just under 3000 pounds, most of which was engine, fuel, armament and—that which is so dear to a combat pilot's heart, or whatever anatomy—8 mm armor plate around the cockpit.

Riding nine cylinders for all their worth, Chkalov clocked off a top speed of 224 mph in time trials. When the production model (I-16, Type 4) went into squadron service in the fall of 1934, it became the world's first operational low-wing fighter with retract gear.

During the February 18, 1934, military trials, Chkalov tested an improved version, the I-16, Type 4.² When its Russian-built Wright Cyclone engine checked out at 282 mph (9842 ft.),

Valerii must have uttered the Russian equivalent of "Wow!" That was one hot-little-airplane.

So hot, in fact, that it required the skill of a Chkalov to handle it. Wide-eyed young military pilots soon found that its dicey behavior took a little getting used to.

As unstable as it was maneuverable, the high wing loading gave it takeoff and landing speeds beyond the norm of the day. And the retractable gear, which added so much to its flying speed, required 25 turns of the hand crank at a time when the pilot really had quite enough to occupy his mind.

Since most Soviet fighter airfields couldn't accommodate its takeoff of 755 feet and landing run of 985 feet, production of the improved models was held for 18 months, while airdromes were expanded to accept it.

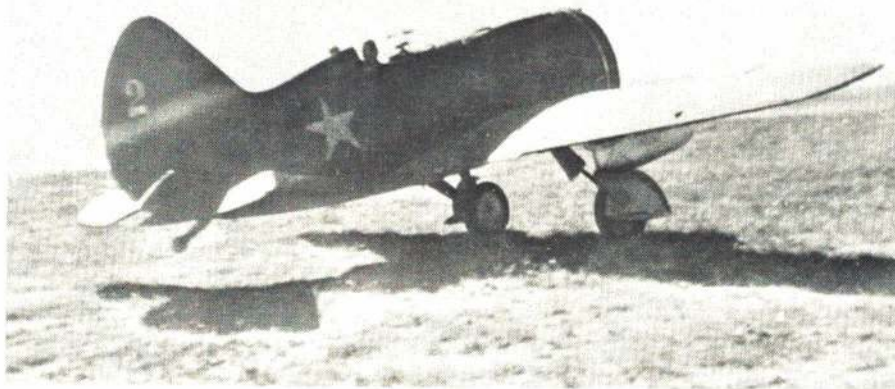
Meanwhile, back at the plant, priority was given to a two-seat trainer, which was delivered at a ratio of one trainer per every four aircraft.³ Then, to be sure to cover all the bases, Chkalov and a couple other top-notch

pilots were sent out to convert the silk scarf and goggles boys.

On November 5, 1936, the chunky little monoplane appeared for the first time, in the skies over Spain.⁴ The first of 475 I-16s that would go to Spain, it had followed by less than a month the arrival of the first of the Russian technicians sent to assist and advise the Spanish Government forces then battling the Rebels. If the proof of a pudding is in the eating, then no amount of war games and mock battles played at home can adequately test military equipment and strategy like helping a dear friend through a good ol' convenient war.

The seeds of Spanish rebellion had been planted long before national elections led to the departure of their king in 1931. Internal ferment and changes in leadership followed over the next several years, until July 1936, when the break was made by a well-known and popular military officer, General Francisco Franco.⁵

Franco, then Commander of the Army in Spanish Morocco, departed



Two under-the-wing drop tanks extended the range of this late model I-16 from 248 miles, at 185 mph, to 435 miles without loss in speed. (Photo courtesy of National Archives)

Africa with his troop of Moors and the Spanish Foreign Legion, and landed at Cadiz, Spain. Here, calling for the overthrow of the Popular Front Government, he was joined by many garrisons and part of the Navy. The Revolt then spread over the western half of Spain in its drive to the Spanish capital of Madrid.

The Government forces appealed to outside help, with first aid from the Soviet Union arriving on October 10, 1936. Within days, shipments of Russian-built fighters and bombers, personnel and equipment began arriving along Spain's eastern coast.

Franco then appealed to other countries. Portugal, Fascist Italy and Nazi Germany responded, and by the end of the year, elements of the Legion Condor and the Aviacion Legionaria were arriving in western Spain.

Other governments, though in sympathy with one faction or the other, maintained at least a surface neutrality. And, within the borders of Spain? Well, nary an eyebrow was raised at the influx of thinly-disguised "vacationers" or "returning Spanish nationals" pouring in everywhere, from everywhere.

Around Christmas of that 1936 year, the French liner, Normandie departed New York Harbor for LeHarve.⁶ Among the ship's passengers enjoying the festive farewells was a young free-lance pilot. While his passport was 100% Spanish, the accent was pure Arkansas.

A few days later Francisco Gomez Trejo (nee: Frank G. Tinker, Jr.) reported to Spanish agents in Paris, who immediately whisked him off to a train heading for the border between France and Spain. Keeping conversation to a minimum, Tinker finally arrived at the Government training field at San Xavier in eastern Spain. Here he met a host of other Spanish nationals like himself—Yankee-Spanish, Gallic-Spanish, Oriental-Spanish. . . .

Following preliminary check-outs and training, Tinker and some other Americans were formed into La Patrulla Americana, at Valencia. It was here that he was introduced to his Spanish (a real one!) commanding officer, a Russian instructor and a biplane that he was "tickled to discover, handled exactly like the Navy F4Bs."

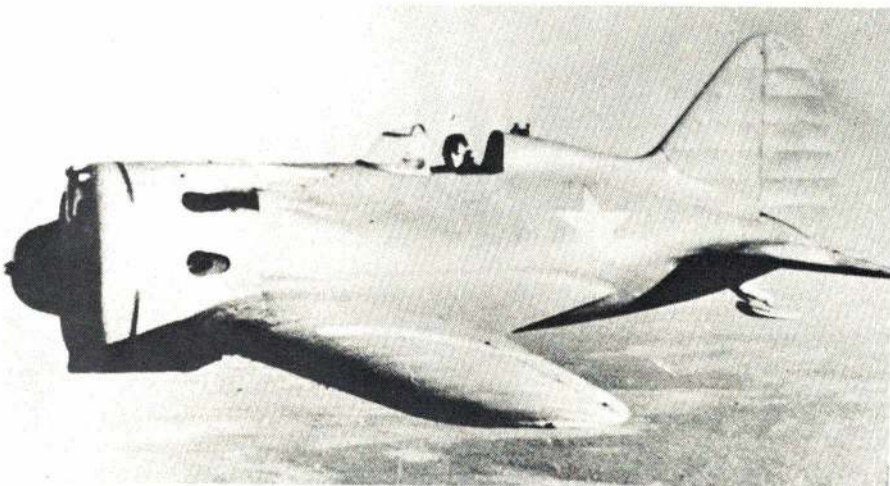
Spanish air space, in those days, had all the flavor of an international fly-in. One could observe 90 mph Nieuports escorting 1925 Breuget bombers, to the latest from the factories of Junkers, Heinkel, Caproni, Fiat as well as Mr. Polikarpov's I-16.

Although by now it was a couple years old, it was still relatively unknown outside the Soviet Union. So when the American Patrol landed at its first duty station, they were intrigued by the sight of "ten sleek-looking monoplanes" parked at the end of the strip. Belonging exclusively to the Russian Squadron, to Tinker's chagrin, he learned they were flown "only by experienced Russian pilots," and there'd be a "slim chance for us to fly them."

On the morning of February 10, 1937, the biplanes of the American Patrol went into action. Returning from



TOP: Captured I-16 in Finnish Air Force markings (Photo by Bjoern Karlstroem) LEFT: I-16s were the standard Soviet single-seat fighter serving in front line units from 1934-1942. (Photo courtesy of National Archives) BELOW: Fabric-covered tail shows up well in this photo of an I-16, Type 24. (Photo courtesy of National Archives)



his third sortie on that first day, Tinker observed the Russian Squadron coming out to reconnoiter the day's score. Wheels up, they presented a "wicked" looking silhouette in the late afternoon light: "They came into the field after we did so we had the pleasure of watching them land." Accustomed to hefty, fixed gear, Tinker found "their landing gear especially remarkable. The field at Guadalajara was very rough, and although these planes land at 100 mph, I saw no wheels carry away. . . ."

Over the next several months, constant activity gives Tinker a chance to prove himself, and in May he's assigned to the alluring monoplane, Triumph!

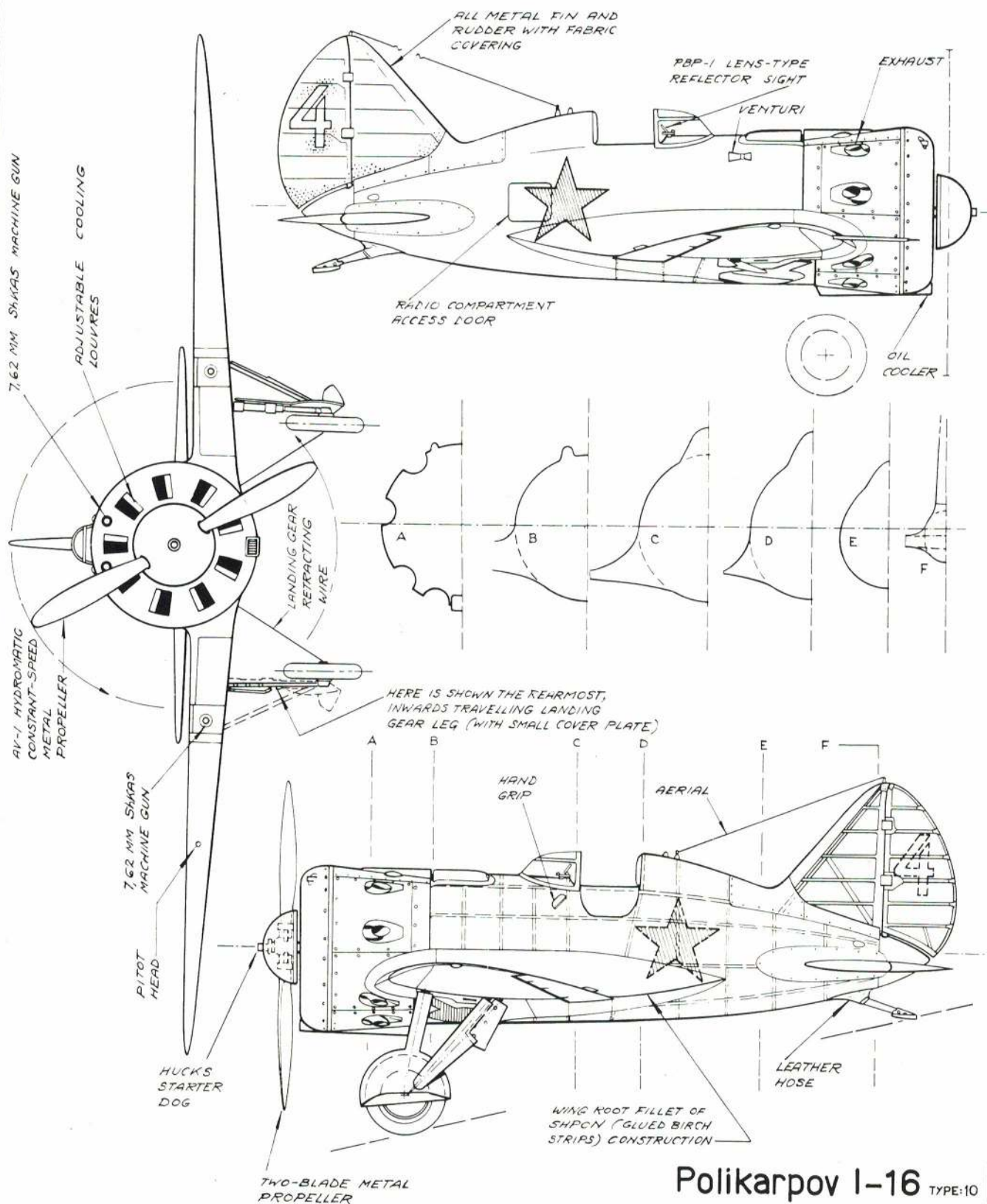
The first phase of training consisted of spending an afternoon sitting in a

blocked up airplane, practicing raising and lowering the landing gear. (Incomplete "re-cycling" of a biplane pilot's takeoff and landing habits had wiped out many I-16s.)

Then, checking out a trainer, he found its 250 mph "in the straight-away" impressive. In a dive, the needle went off the peg.

Following 30 minutes of playful aerobatics the next morning, Tinker was qualified in the I-16. Within minutes, he was on active duty in an I-16 all decked out in the Popular Front's now familiar markings, a red stripe on the wings and fuselage.

Text continues on page 94
Plans on pages 60 & 62



Polikarpov I-16 TYPE 10

SCALE = 1:48 ($\frac{1}{4}$ " = 1'0")

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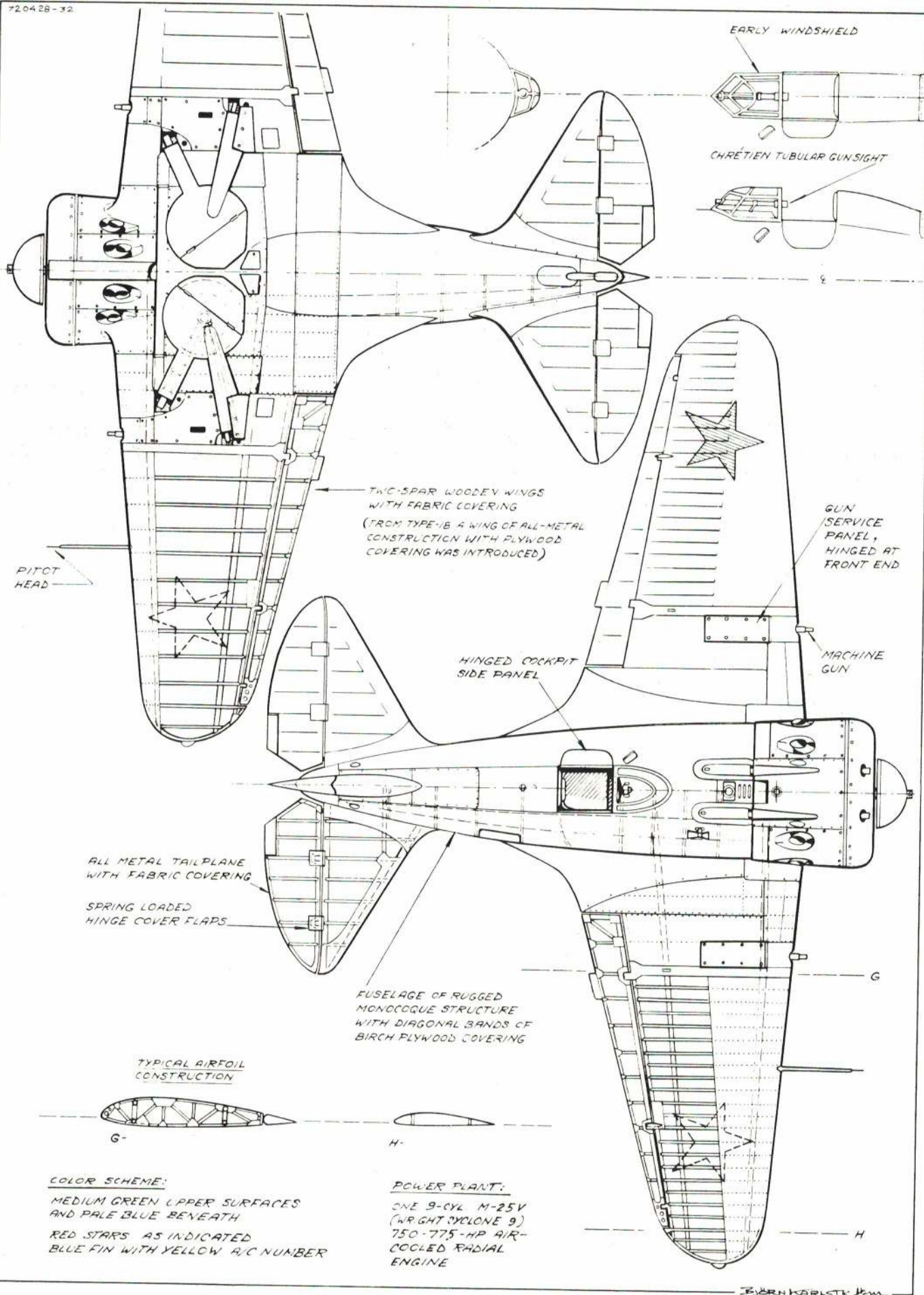
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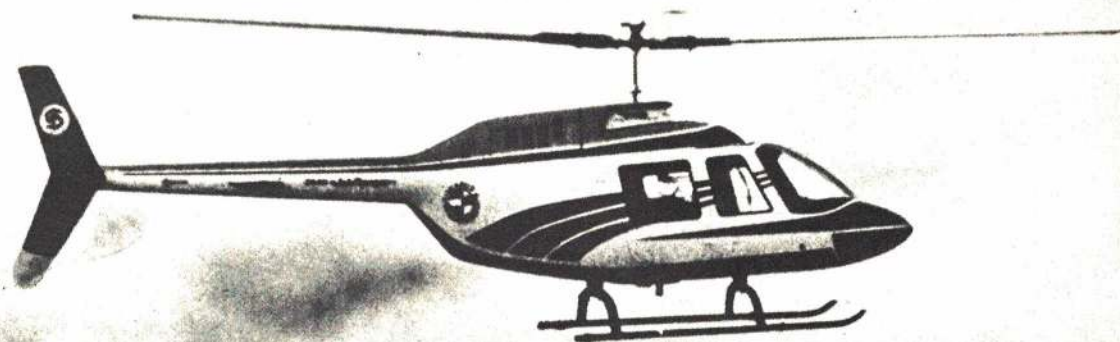
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Big Boy IV

Wiener Neustadt, Austria. In the dwindling light of a summer evening, a local free flighter takes one last flight with his FAI power ship. The design is a basic one that he has been refining for 13 years. Less than two minutes later his plane lands. . .and the man and the model are World Champions. / by Vaclav Horcicka

The origin of the Big Boy FAI series reaches as far back as 1960, when the FAI announced an engine run reduction from 15 to 10 sec. Till then, I had stuck to small models of conventional layout, using mainly 09 diesels. The ultimate 1960 model used a Webra 1.5 cc diesel, and followed the lines of Carl Wheeley's 1954 Internationals winner.

Obviously, with the engine run reduced by 35%, a design with more potential would be needed. Some 09-engined experimental models were made, among them two high thrust line designs, which seemed to bring about the best results in terms of performance and reliability. On this basis, Big Boy I was designed for 15 power, using the then new Austrian Bugl 15 Oliver diesel, with the highly efficient Czech 8 1/4-3 1/2" MVVS wooden props. An ED timer for cutoff, plus a Tatone DT were used. Neither autorudder nor autostab were employed.

The initial experience with Big Boy I was quite good, and prompted me to conceive Big Boy II for the 1961 Internationals. Some modifications were incorporated, including omission of the wind LE sheeting and a more highly cambered version of the original NACA 4409 airfoil. Big Boy II finished 13th at Leutkirch in '61.

In subsequent years, quite a number of local and regional contests were won, mainly by Big Boy II with Big Boy I as a standby. In 1962, '66 and '70 Austrian Nationals trophies were brought home, each time with a full house score. In 1963, Big Boy I was damaged beyond repair and, therefore, Big Boy III was constructed. This was almost identical to Big Boy II, and employed a Supertigre G 15, a modified Autoknips for flood-off. It refused to fly properly. In a January 1964 contest, it flew away and was not returned until April—after the snow had melted away. Having dried it thoroughly and replaced both timers, I went out to retrim it. Big Boy III now flew as never before!

Meanwhile, various glow plug engines were tried in Big Boy II, finally sticking to a Czech MVVS RL, which stayed in the model until July 1973.

After the 1966 Austrian NATS win, plans for Big Boy IV were made. Autorudder and a variable incidence tail were to be incorporated. The use of the then new .5 horsepower HP 15 diesel was en-

visaged. As I could spare less and less time for modeling, construction did not start before 1967. Wing and stab were finished, and then no further building activities could be carried out until 1972. I flew very few contests during this period.

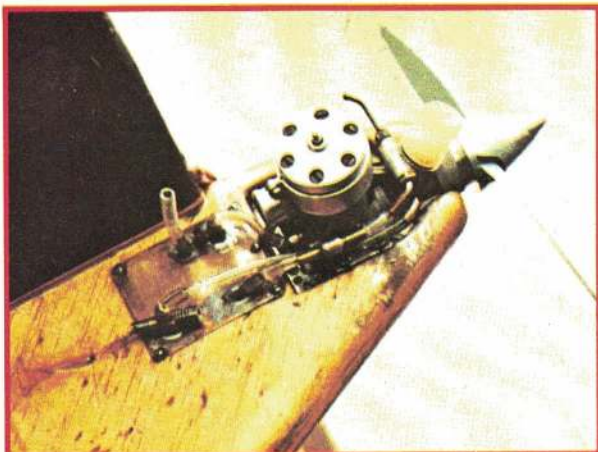
In 1969, Big Boy III was fitted with a tuned pipe Supertigre G 15 and was used in the World Champs eliminations. Here, it flew away, due to DT timer failure. This made me a spectator at Wiener Neustadt that year, and stopped my flying activities altogether for a year and a half. I resumed flying at very short notice in the fall of 1970, using the sole remaining Big Boy II to win the Austrian NATS. After this unexpected

success it was decided to go in for the 1973 Internats, to be held on my "home field" at Wiener Neustadt.

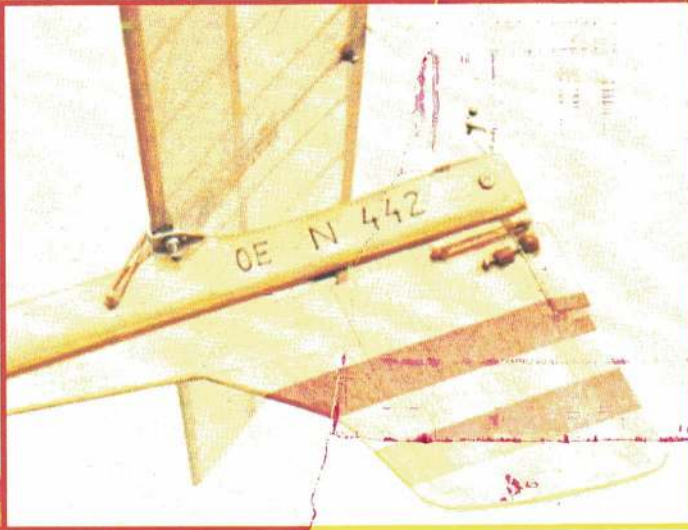
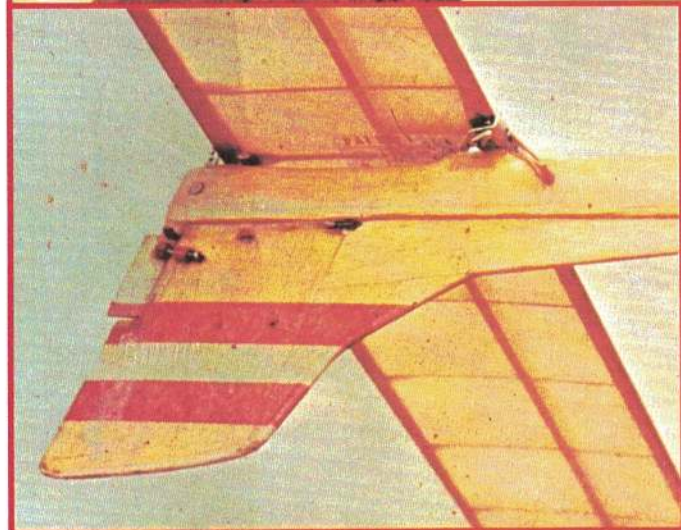
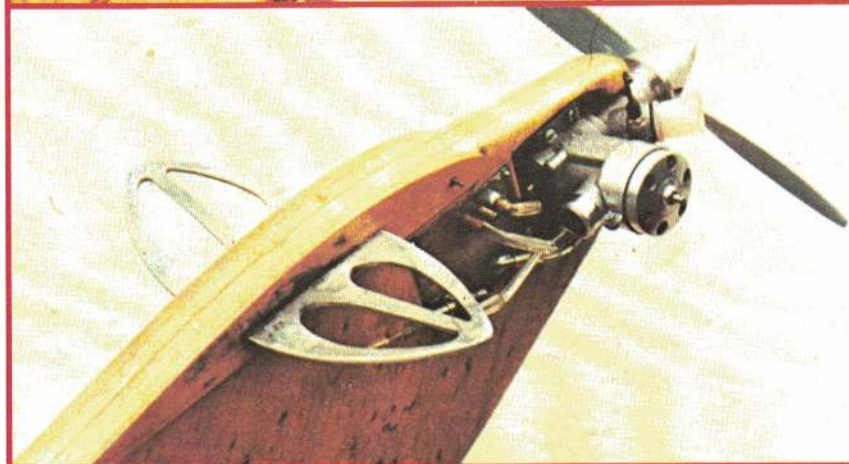
Let me remark here that it is a genuine three-year task to compete in a World Championship as member of the Austrian Team. Every year, the Austrian Aero-Club issues an official contest calendar, which lists between eight and ten national and international free flight contests counting for the elimination. The best five times of each contender for 1971 and '72 are tallied, and the top three form the Austrian team for 1973. The 1973 results of the Austrian free flight and RC teams confirm that this system works. It is relatively cheap for the Aero-Club (no separate elimination

Andrea holds a world-beater. The Big Boy IV proved its claim to fame by winning the 1973 Internats.





TOP LEFT: Fuel tank plumbing is well thought out. In upper part of the tank are the fill tube (which is sealed by connecting it to the adjacent overflow tube), and the pressure line (in the corner). At the bottom left corner is the flood-off valve. Bottom front is, of course, the feed line, with the all-important filter. **TOP RIGHT:** In the text, the author evaluates the pros and cons of high-thrust aerodynamics. One thing for sure, it makes for convenient installation of all the gadgetry. **LEFT:** With aluminum wing plugs exposed, the power side of the nose assembly is all business. . . no wasted space here. Engine is a Rossi 15, with a Czech MVVS prop. **BELOW:** When Horcicka first began the Big Boy series, he regarded autorudder and V.I.T. as detrimental to contest reliability. After 13 years of development, the Big Boy IV has everything moving. Adjustment screws on the stab platform, V.I.T. lever and autorudder must be "tweaked" to optimize climb as engine run is reduced.



contest), and gives a chance to every modeler interested.

You have 15-20 contests, out of which you have to choose at least five, or more if you wish to improve. There is no absolutely fixed date you could miss. You only have to see that you retain a high standard of flying and you *have* to fly anyway. As it was questionable to take on this much competition with only one model, Big Boy IV was finished in the spring of 1972.

For propulsion, an exceptionally good G 20 was chosen, for this model, but plans to install it fully cowled inverted were dropped. Great emphasis was put on reliability of the autorudder and V.I.T., which are operated by a

Seelig timer, along with DT and flood-off.

Originally, Big Boy IV came out with the CG at 100%, and was virtually useless. Also, the G 20 proved to be powerful, but erratic. Lacking the time to make a new model, I first took away every fraction of dispensable weight behind the CG (see pictures), and then started to experiment with different stabs. By spring of 1973, the correct stab was found. With a hot G 15 up front, Big Boy IV suddenly began to show its teeth. At the Munich International Contest, I came in fourth, when one of the set screws loosened during the flyoffs, and the model stalled all the way down.

In July, a brand-new Rossi 15 replaced the G 15, making careful retrimming necessary. Big Boy II, still going strong as my No. 1 reserve, inherited the G 15 and was set aside after only a few flights. Time was scarce for Big Boy IV, so I decided to employ a time saving trimming technique. This meant going out to the field early in the morning and after the working hours, for one to one and a half hours at a time. This leaves time to make only one to three flights per session. However, you encounter different atmospheric conditions each time, and you practice the complete sequence from leaving home

*Text continues on page 88
Plans on following page*



Where the Action is



BOB STOCKWELL ON PYLON

Want To Race?: Last month we tried to answer the question, "Who should go in for Formula I Pylon Racing?" We hope that you are one of those whom our description of motivations and qualifications fit. We hope you are already considering what sort of airplane to build, and could use some advice on that score. Anyway, that's what the column is about this month: what bird to build for Formula I Racing.

We prefer balsa, but there is not much evidence to support our belief that balsa is better than other materials. Bob Smith can beat just about anybody with his epoxy fiberglass Miss DARA, and the airplane is extremely competitive in the hands of a dozen or so other fliers: Dan McCan, Larry Leonard, Ed Rankin, and Kent Nogy have all won their share of races with the same airplane. But, as good as it is, I'm not sure that it should be one's first Formula I. Any shoulder-wing airplane is a little tricky on takeoff, especially if there is a crosswind. Use of the rudder will have the same effect as aileron, so that it's not hard to catch a wing tip on takeoff with this

style of airplane. The wing of the Miss DARA has a relatively low aspect ratio and a laminar airfoil, which together make it easier to snap in the turn than most of the low-wing competition. And, finally, it has long springy landing gear placed rather far back, so that it bounces a lot on landing and has a distressing tendency to nose over. It is, of course, a very clean bird, with the leading edge of the ailerons recessed. There is a strikingly beautiful smooth contour from the nose through the wing section. And it has lots of room in the belly for the radio and tank (though the aileron servo installation is a hassle, up in the canopy). But it's not the plane with which to start, anymore than the old Rivets is.

The Rivets, if you remember Joe Foster's beautiful yellow version that was widely copied in 1968, has a sharply swept leading edge. This feature makes it a bear to handle in the turn around the scatter pylon. It wants to tuck and dive. There is another version of the Rivets called the Thunderchicken (we ran a handsome picture of the one built by Glen Spickler a few months ago), which has a conventional double-tapered wing: this one flies extremely well. But you still have to wonder whether that T-tail is worth the trouble, and you'd have to build it from scratch because there are no kits available.

One of the best shoulder-wing Formula I ships ever built is the Shoestring. There are several versions of it that are highly competitive, e.g., the Ricky Rat (now kitted in balsa by Jack Stafford Models, Inc.). It has an exceptionally high wing aspect ratio, and has shown itself (in the hands of Cliff Welrick and Kent Nogy) to be one of the smoothest and cleanest ships you can build. It has the disadvantage of requiring one-piece construction,

which is a little awkward for storage and transportation.

The El Bandito is another version of the Shoestring, with a stubbier wing than the Ricky Rat. There is a good polyester fiberglass version that Bob Francis designed. A number of the San Jose fliers have shown it to be a fine competitor, especially Ron Sheldon. The Miss Cosmic Wind, which is a Minnow/L'I'l Toni wing on a Shoestring fuselage, with straight leading edge and strongly swept trailing edge, is the plane that the 1973 NMPRA Championship winner, Bob Violett, has flown with great success and truly amazing consistency.

Considering everything, though, we have to claim that you'd be better off not to start with a shoulder-wing aircraft. They are, probably, cleaner than low-wings where the wing and fuselage meet: that, indeed, is their one virtue—you can streamline the cheek cowl right into the leading edge of the wing. That has just got to reduce the turbulence substantially. Also, because the wing meets the fuselage, both top and bottom, at an angle greater than 90°, fillets are unnecessary (which saves both work and weight).

However, it's not apparent, from our experience during the past several years, that you gain enough to be worth the trouble. Low-wing aircraft are, in general, easier to build, and easier to take off in a fairly straight line. In fact, toward the end of 1973, it was low-wing aircraft that were setting the new records: Kent Nogy with his L'I'l Toni at 1:21, and Terry Prather (at the Tangerine) with a 1:17.2, flying his own version of the Minnow. This record will, in my opinion, stand throughout the entire coming season.

Prather's Minnow is an all-balsa construction (the wing is foam, sheeted with balsa and

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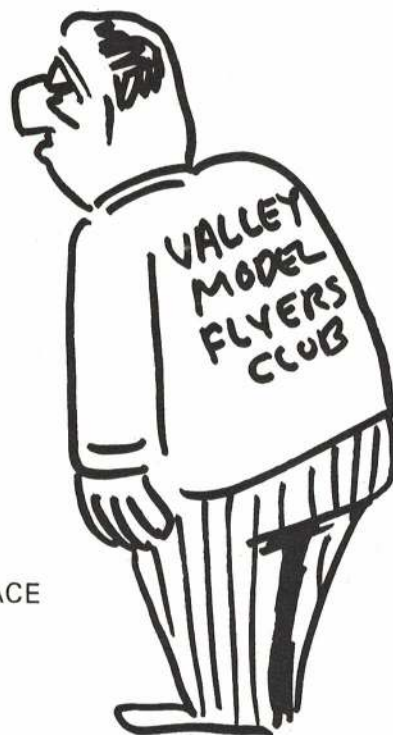
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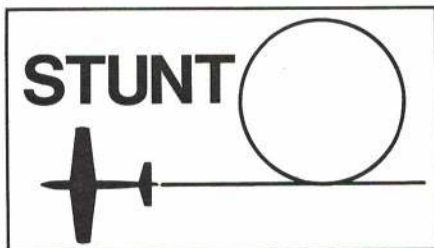
Bob Violett (this man is smiling!) with his slim version of the mid-wing Cosmic Wind. Bob calls it the Cosmic Trick, and it did... the trick.

Favored among the Southern fliers, the Stegall Minnow has a plywood sheeted foam wing. This stock version is that of Irwin Funderburk.



layered with fiberglass and polyester resin). Except for the fact that his wing tips have no wash-out, Terry's Minnow is the same as the Minnow that you can build from Stafford's kit. The wing wash-out that the standard kit provides is an enormous advantage when it comes to landing the airplane, and also adds stability for the tight turn around the scatter pylon. Stafford has the same wash-out in both the Ricky Rat and the Minnow: it appears to have no deleterious effect on speed, and it should help on landing and takeoff.

(Continued on page 108)



DON LOWE ON RC

The New FAI Pattern: How many of you have tried the new FAI pattern? It's tougher for sure! In particular, the Figure M is a killer, and the Top Hat requires brute power (and a lifting of the 400' ceiling!). Personally, I'm all for progressively toughening the Pattern, since we need more tie breakers—as long as the element of luck is eliminated.

The new Figure M is especially good, since it is very demanding in terms of pilot skill. It requires a very good machine, and has a mini-



mum of luck involved. There should be plenty of zeros from this maneuver, and a lot of low scores. It also requires the aircraft to roll faster than normal in order to get quickly through all four of the half rolls.

The Top Hat, in my opinion, is not a good maneuver, since it requires a brute of an engine to complete the full vertical roll and get over the top cleanly. If you have the power, it's no more difficult than previously, but tends to be very high and big, unless you have an extremely fast roll rate. It appears as though we will have to have a fast-slow roll rate option on our transmitter, and some manufacturers are already providing this—I just had my Pro-Line modified. My Phoenix 6 has no problem with the Top Hat. I use either the ST 60 Blue Head or Ross 60. Lesser engines will not suffice, unless you have a very light and clean aircraft.

The Rolling Eight will be interesting, since the half rolls are part of the two loops. We either will have two flat spots in the middle of the maneuver, or ships will have very fast roll rates to reduce the flat spots. I'm happy to see all the rolling maneuvers: horizontals, four-point, eight-point and slow roll, plus all the additional rolling in other maneuvers.

The requirement for completion of a maneuver per pass is very good, since it makes you think harder and plan ahead—no more waved off maneuvers. I feel that all of the patterns should be flown that way. The sequence is O.K., except that having to do the outside loops upwind will be a new experience. Any comments from you Class D fliers out there in model land? We'll be glad to pass along your thoughts to other modelers.

NSPA and NSRCA: These are changing times—organization and new events are the theme. Two new pattern organizations are off and running. These are designed to serve the special needs of all pattern fliers. The NSPA, or National Sport Pattern Association, is the brainchild of Jerry Nelson, and had its first organizational meeting at the Toledo bash. The principle objective of the group is to promote sport and competitive biplane flying—so, all you biplane lovers, this is for you! Information can be obtained from Jerry Nelson, 23 Marie Dr., Downers Grove, Ill., 60615. Jerry is acting Secretary-Treasurer. Olie Olson of Omaha was nominated as Chairman of the group for 1974 at Toledo.

There is a move afoot to replace the Class C Pattern event with a biplane event, as proposed by Jerry. This makes sense, since the Class D Pattern really fills the need for an

These swingers are multi-wingers ready for the 1974 National Multi-wing Championships. Extra points are available for realistic appearance.

Miss Sandy Cramer (Miss Nebraska of 1973) is Queen of 1974 National Multi-wing Championships, scheduled for July 6-7 in Omaha, Nebraska.



Expert Class. Eliminating Class C would simply delete from the books an event that is not needed. The biplane fliers already have their first contest, per the new rules, scheduled for the 16th of June in Chicago. Those interested can contact Jerry for information.

Another biplane event will be the Second Annual National Multi-wing RC Championships to be held in Omaha, Nebraska, on July 6-7. This contest promises to be bigger and better than ever, since they are aiming at a prize list of over \$1500. For further information, contact O.L. Olson, 6111 Maple St., Omaha, Neb. 68104.

The NSRCA, or National Society of Radio Controlled Aerobatics, held a meeting in Toledo. Many people were in attendance, including John Worth, Executive Director of the AMA. A number of important matters were discussed, including the Pattern Events at the Lake Charles NATS this year. Recommendations were also given for the FAI team selection process. It looks like we will fly Class D Pattern at the NATS, and provide more time for Class A and B. It is likely, at this writing, that the FAI team selection system used in the past will be continued.

As I see the NSRCA, it can be a strong advisory group to the AMA on Pattern affairs. It will be what the membership makes it—so join up now. Address all applications to Rhett A. Miller, 3039 Lakeshore Dr., Tallahassee, Fla. 32303. Oh, yes, the membership fee is \$4.00 per year.

LEW MCFARLAND ON CL

Maneuver Of The Month: To quote the AMA Rule Book: 13.2. Takeoff and Level Flight. A correct takeoff consists of the model rolling smoothly along the ground for a distance of not less than 15 feet, then rising smoothly into the air with a gradual climb to, and a smooth level-off at, normal level flight altitude. Model continues on for two smooth laps of normal level flight to point of original level-off. It is recommended that the circle be marked in 15-foot increments.

The wording is self-explanatory; but notice the words "smoothly" and "not less than." Nothing says that you cannot roll more than 15 feet. You can bet that anything over 1/4 lap could detract from your score, and also prevent the remainder of the maneuver from blending into one realistic and precision maneuver. FAI rules specify that the roll shall not exceed 1/4 lap. If you are putting on a contest, why not mark the runway at 15-foot increments, thus leaving one less thing to personal judgement and human error.

Remember that the maneuver is not over until two laps of normal level flight (four-six ft.) have been completed. FAI rules specify that level-off shall occur exactly one lap from point of takeoff release; otherwise an error has occurred. You may note that the FAI additions do not conflict with the AMA wording, but are merely more specific. The perimeter of the circle can be marked to indicate the normal level flight altitude (four-six ft.), thus one less item left to judgement. I have seen judges and contestants forget that the level flight is part of the maneuver.

I do not know of a real sure way to "ace" this maneuver. A few hints and ideas: Get as close to the ground as practical by leaning and/or crouching (with arm fully extended) during takeoff, to help produce a very gradual ground breaking. This posture also helps lead the plane right on through to level flight.

Here are some thoughts and experiences from Robert Bruce Cousins. "Only a warp-free ship will hold level flight. If your ship wants to fly at, for example, a 15° elevation and stay there, then your wing is warped, and

the ship is finding the balance of forces due to this warp. Rewarp the wing straight or twist the flaps (which I never do). The object is to fly at five feet. Hold in your mind the fact that the ship will rise going upwind, and descend going downwind, according to the strength of the wind. Be ready to gently drop your arm going upwind to counter climb effect—don't wait until the ship rises to tell you. Be prepared to gently pull your arm in on the upwind side in order to pull in line slack.

"If you have a rich motor run, practice leading the ship by walking in a forward circle to hold line tension. Also, if the engine is too rich for maneuvers, take advantage of the flight to check the alignment of the wheels (to show yaw angle). The outboard wheel should appear about 1/4" behind the inboard one.

"This is also a good opportunity to check that the plane flies level, and then adjust the outboard tip-weight. Your plane will not fly



I could get it down in one piece! It really is important to learn to properly fly level, because almost 45 percent of the flying time in doing the pattern is used flying level! Think about it; even if you can't fly the other 55 percent, it's nice to know that at least half of the flying time will be done beautifully!"

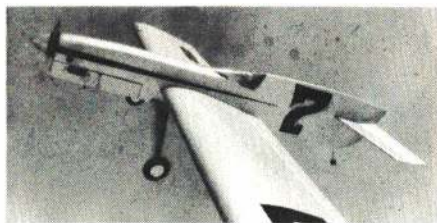
Bob's indication that the ship must be correctly trimmed cannot be overemphasized. If we had control of such matters, I would have each new modeler go through free flight trimming school before entering his chosen category. If a stunt ship is not capable of "hands off" level flight, there will be trouble with the entire pattern.

It would be nice to never have to resort to bending or twisting flaps. However, in my case, this process has been used many times to correct a slight roll tendency. It also helps to correct for pitch problems. Most ships have more total flap area than elevator area, thus the flaps act to trim the elevator up or down (we shoot for aerodynamic neutral stability). Be aware that an error in alignment for up flaps will cause the ship to climb, and vice versa for down (assuming that the flaps have more area than the elevator).

Total flap adjustment can be very simple on a ship with a removable wing (a la RC). Each flap can have independent adjustment, so that any type of alignment and sensitivity correction can be made. A means of varying the tip weight could also be helpful in trim-

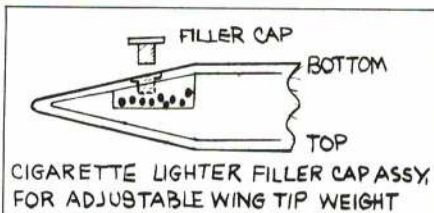
Who says that impression points are a factor? The 1972 "Texas Kids" NATS winners. Al Rabe (right), first; Bob Gieseke, second; and Bill Rutherford, third.

Robert Cousins' Radian O.D. has not only unusual lines, for a stunter, but also features an RC tank and spring torsion landing gear. (Photo by Bob Cousins)



ming the ship. George Higgins III has suggested having a portion of the tip hollow, and varying the quantity of split shot weights to get desired results (see drawing).

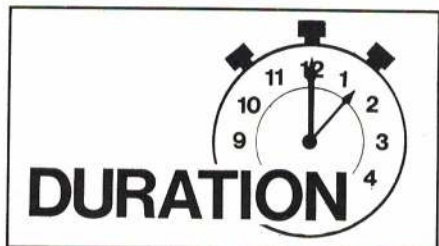
My study of Takeoff and Level Flight became much more involved than I expected. I'll need help from everyone on the real acrobatic maneuvers. I have never accomplished a reverse wing-over to my total satisfaction (or the judges'), so HELP!



level until it is able to *all by itself!* Your plane should be so adjusted that if you were to let go of the lines, it would fly off in a level flight! When you have reached that point, 75 percent of the battle is won. Otherwise, you will be fighting a plane that doesn't want to cooperate. We need all of the cooperation we can get!

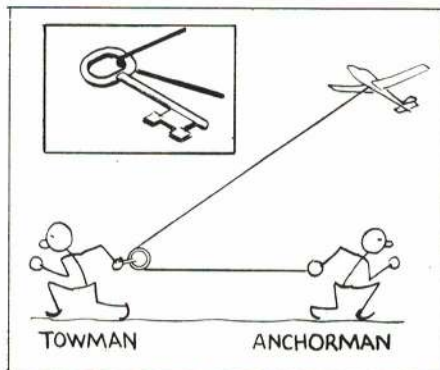
"Don't get upset if the engine is running too rich for maneuvers—take advantage: (1) The engine is getting broken in—a good thing. (2) Observe your ship for adjustment. (3) Learn to compensate for wind. (4) Observe the height above the deck; work to maintain flight at eyeball. (5) Relax and enjoy it. Lean back a little and feel the pull of the ship. . . it's a wonderful day and you and your plane are one!

"I spent most of my early flights either getting the engine to run right, or praying that



CARL MARONEY ON RC

Two-Man Tow: From Mr. A. Ponjee comes the idea which he utilized, some 35 years ago, while flying free flight models in his homeland, Holland. As shown in the TMT illustration, the anchor man runs in the opposite direction of the tow man. The speed of the

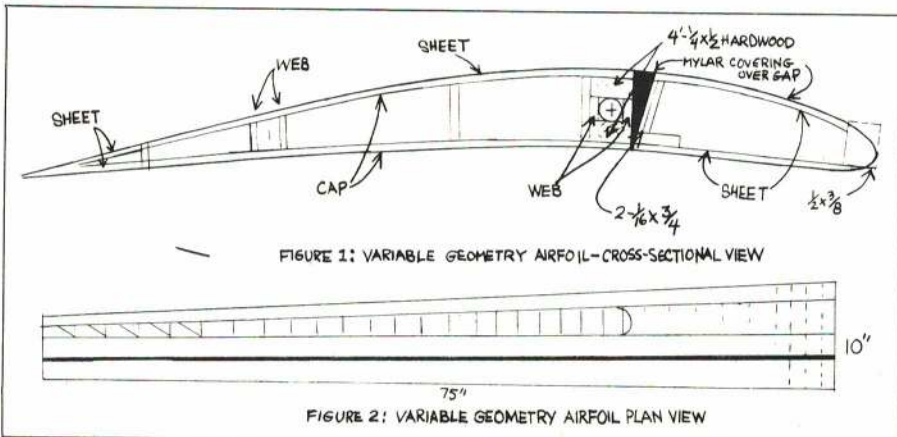


glider is now the sum of the speed of the tow man, plus twice the speed of the anchor man. One sure advantage of this hand tow system is that the anchor man is running towards the pilot and saving his vocal cords.

If, by some miracle, you have one of those old-fashioned door keys with you at the field, it can be used to experiment with this method. The glider should be extremely lightweight, since the friction created by the line rubbing on the key will result in excessive line wear in time (as well as a hot key). If there's a knot in the line, you stand a good chance of looking straight up at the sky, so play it safe and build yourself a pulley reel. One disadvantage of this type of system is that the "live"

tow line becomes shorter during the tow, and at a rapid rate.

Soaring Festival: The famous outdoor chef, Ray Smith, will be serving the buffet (consisting of a beef roast) on Saturday, June 1, as a prelude to the annual DC/RC Glider Meet. The barbecue will take place at the Old Bowie Airport in Maryland. The contest itself will take place on June 2. According to AMA records, the DC/RC officially held the first sanctioned glider meet in this country. The contest is the feature event in the East, and has the largest overall turnout from this part of the country. If you want to obtain a contest flyer and map, drop a postcard to the



DC/RC Soaring Meet CD, John Spalding, 5803 Ellerbe St., Lanham, Md. 20801.

Variable Geometry: From the Harris Hill Lift-Over-Drag Soaring Group comes an experimental project carried out by Ernie Heyworth, who developed a wing that can be changed in-flight to produce an airfoil having various shapes. The basic airfoil is slightly undercambered, as shown in the cross section view (Figure 1). The forward third of the airfoil pivots upward and back at the base, which almost gives a flat bottom shape.

The shaded area in Figure 1 (and further shown on the plan view, Figure 2) actually disappears when the forward airfoil section is in the full-up position, becoming a flat bottom profile. This design concept shows a mylar skin surface over the air gap to provide for smooth air flow, and a semi-flexible top wing skin.

Two key objects must be met in the construction of this wing: (1) simplicity in move-

(Continued on page 110)

BOB MEUSER ON FF SPORT

The NATS: At this writing, plans are being formulated for a greatly expanded schedule of Free Flight events at the Lake Charles NATS. Many of these will not appear on the official AMA schedule, so keep your eyes peeled for announcements in AAM, the AMA Competition Newsletter and the NFFS Digest.

In addition to all of the official events usually held, there will probably be the following additional official events and unofficial events: Payload, Cargo, Gas Helicopter, a full program of Old-Timer events, Gas Hydro, Rubber-Power Helicopter, CO-2 Scale (CO-2 engines are allowed in the Outdoor Scale Fidelity event, along with "gas" engines, but there will be an additional event for CO-2 engines only), Outdoor Peanut Scale, Indoor Peanut Scale and Navy Scale, Indoor Pennyplane, Outdoor Rubber-Power Speed, and two Electric-Power Free Flight (nonscale) events.

The rules for Rubber Speed used last year worked well, and will be essentially the same: 200-ft. course, 100-ft. wide finish line, ROG takeoff, no barrel rolling, and no dimension over 36 in. The Electric Power rules are being worked on, but at present it appears that there will be a Duration event for any model powered by an absolutely stock Mattel Super-Star or SS Sky Show power unit and prop.

I have proposed that the second Electric

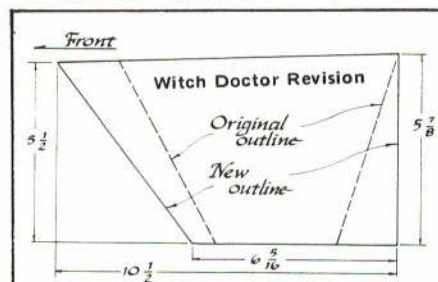
Trying something different is fun, but fortunately, nothing this complicated is required for winning. This gear-coupled, coaxial, counter-rotating Wakefield prop system was tried by Paul Helman.



Power event be for any size model, any motor, any battery, but having a motor-run limitation of 15 sec. Models will have to incorporate some sort of visual signaling device—dropping of a pennant, for example—to indicate, to the timer, that the power has been cut off. This might be a problem, but I hope not an insurmountable one. We understand that A/1 and A/2 Towline Glider will be held as two separate events, not combined in some age classes, as in the past.

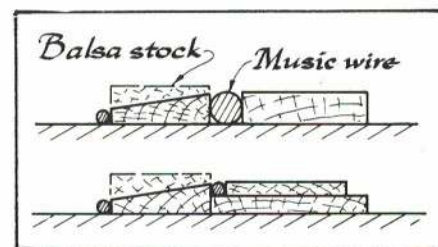
From what we have heard about the site and the layout of the areas for FF, RC and CL, and if the weather cooperates, the 1974 NATS should be the great one you'll be telling your grandchildren about, provided enough people volunteer to run all those events.

Which Witch Doctor?: It seems that Jim Clem's popular Sig-kitted Witch Doctor 800 (August 1973 AAM, page 29) emerged from its winter hibernation with a new set of tail feathers. Some of the big Docs tended to wander off the track during the climb, especially with high-powered engines. After



much testing, Jim zeroed in on a larger rudder, which cures the problem. Jim reports that all of the ships using the larger rudder, as shown in the sketch, now "groove" properly during the climb, without any tendency to get off the track. Sig has incorporated the larger rudder in the later 800 kits.

Do-It-Yourself Trailing Edge Stock: If the local hobby emporium is fresh out of the particular size of trailing edge stock you need, or if you need a special size, here is a solution. Start with rectangular stock of the right width and of sufficient thickness. Select pieces of straight music wire, the diameters of which equal the final thickness of the front and rear edges of the trailing edge.



Arrange as shown in the top sketch, using an additional strip of wood to hold the wire in place. Here is where double-sided Scotch Tape comes in handy. Razor-plane the trailing edge stock roughly to shape; then finish it off by block-sanding, using the wires as limit stops to prevent overcutting. The lower sketch shows an alternative solution, to be used if wire of the right size is not available. The idea comes from Jerry Barnette, writing in *Max Facts*, newsletter of the D.C. Maxcutters.



CLAUDE McCULLOUGH ON RC

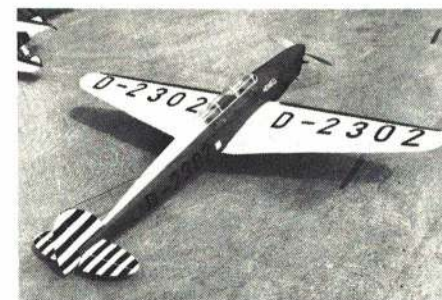
Draw Your Own: Since no really adequate three-view drawings were available for the

Heinkel, Tom assembled all the available published photos, dimensions and drawings for his own set of three-views. These were then verified by the Scale Contest Board Chairman. This is permitted by the AMA rules, in the case of rare aircraft for which usable three-views are not available from the usual sources. Authentication is required by submitting the homemade drawings and supporting data to an SCB member, the builder or designer of the prototype aircraft, the AMA Technical Director or other competent authority.

If this regulation sounds like a loophole for someone to invent a ringer of a drawing, then it just hasn't happened that way. The type of dedicated enthusiast who goes to the extra effort required by this sort of project also seems to have a phobia for getting it as correct as possible. The accuracy and authenticity of the drawings submitted have a standard higher than the average magazine feature, and some of them are really outstanding feats of drafting and research. They often merit publishing in their own right. So consider this avenue if you like some forgotten plane and can't come up with a good plan, but can find a lot of disconnected coverage.

Good News: Tom Stark, 1972-73 Nationals Scale Champion, builds all types of scale models and comes up with rare and interesting subjects. The RC scale McDonnell Doodlebug that he flew last year was a head-scratcher for many modelers. His newest effort, the Heinkel HE-64C, would also provide a tough aircraft recognition test for even a confirmed scale nut. The photo shows the sleek, ahead-

Tom Stark's HE-64C is 1 1/2":1' scale. Now that the craft has had 20 flights, the interior details will be added.

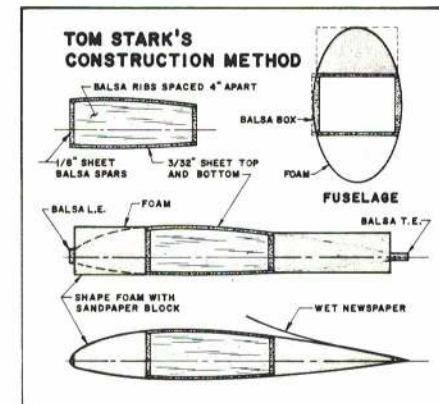


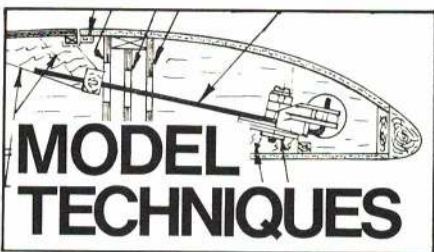
of-its-time appearance of this German bird of the '30s.

Small stab area is compensated for by the long tail moment arm. The full span wing slats of the prototype are reproduced, and Tom feels that they prevent snap rolling tendencies. Powered by an OS 25, the model is very fast; but at 3 1/2 lb. this is not from a high wing loading. He achieved the reasonable weight by a unique method of construction, in which a basic balsa box is completed with foam blocks, sanded to shape and covered with, believe it or not, newspaper!

Here's how the wing assembly goes: The newspaper is applied to the wing with wallpaper paste or wheat paste. Use about three

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FRED MARKS ON RC

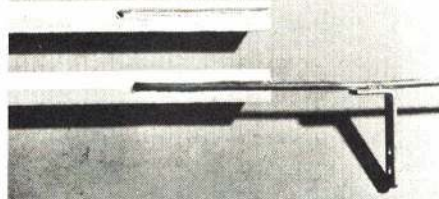
Corrections: I have been writing material for AAM for some six years. During that time, I have reviewed about 40 RC systems and several airplane kits, as well as developing and writing the AAM Commander series. Occasionally, I make a boo-boo, but seldom two in a row! In the January issue, I reported that the Goldberg retract servo mechanism was molded for them by Orbit. It's the other way around! To get the facts straight: Carl Goldberg developed the specification for the mechanism he wanted, then had Bob Dunham make the servo mechanism. Orbit buys the mechanism from Carl Goldberg Models. In addition, the output gear is 1/8" thick; not 3/16" as previously reported.

My second slipup was reporting that the World Engines S-9 servo's position adjustment is done by loosening the pot screws and rotating the pot. Actually, the servo has a built-in adjustable setting that can be reached through the top of the output shaft, using a 1/16" hex wrench. This feature isn't readily visible and, as I didn't have any literature for it, I failed to note the discrepancy. Naturally, I was reminded by World Engines, and I verified that the feature works well. The Goldberg retract servo also has this adjustment feature.

On the subject of the Goldberg retract servo again, Mr. Goldberg informs us that their tests have consistently produced at least seven lb. of thrust. We rechecked the calibration of our thrust measurement test stand, and found it to be in error by less than 1/4 lb. The servo was returned to Mr. Goldberg, and it tested over six lb. on their test rig, which is quite similar to ours.

In fairness to the manufacturer, we really don't like doing one-sample tests. Three additional production servos were provided us for repeat testing. The average output from these servos was 7.5 lb. thrust at a 7/16" radius, for 4.4 in.-lb. torque. The output arm for the servo has been reinforced, since our original tests, by the addition of more material, in the form of tiny gussets at the corners. We attempted to test one of these to failure, and called off the test when a static load of 24 lb. was reached.

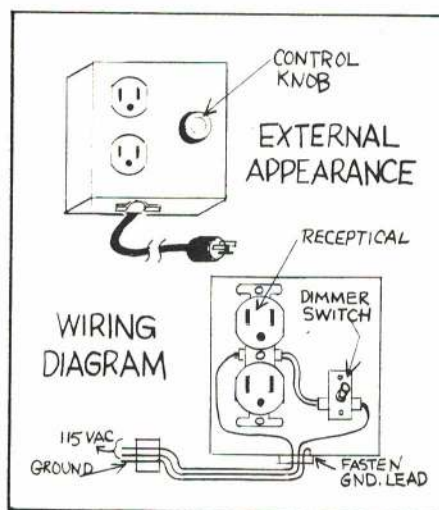
Installing an Elevator Crossbar: The photo de-



tails the proper technique for installing an elevator control horn, or crossbar. Mark the location of the crossbar and drill a 3/32" hole into the elevator. Use an X-acto knife to cut a 3/32" inset slot. Roughen the music wire crossbar and epoxy it in place.

An Inexpensive Motor Speed Control: This item came from a club newsletter for which I've inadvertently lost the title page. It's such a good item that we wanted to present it to you. If the Editor of that newsletter will drop us a line, we would be pleased to give credit. While a G.E. dimmer switch is listed, we built ours from a less expensive 600-watt unit by Thyrocon. It is the SDR-600 "Shot in the Dark" available at hardware stores.

"This unit can be used to control the heat output on a soldering iron or glue gun. It will also control motor speed on light duty drills. I checked it out with soldering irons from 10-250 watts, and it was effective through that range. Tests included both "pencil" and

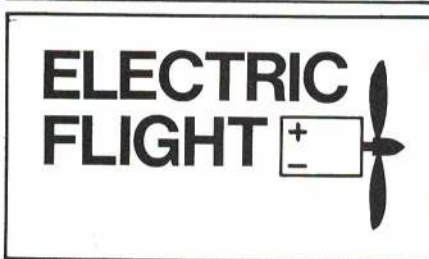


"pistol grip" types. The bill of materials is as follows:

- 1 4" sq. utility box
- 1 4" box cover (with openings for duplex outlet and switch)
- 1 duplex receptacle
- 1 3-wire line cord (grounded type)
- 1 1/2" Romex (NM) connector
- 1 G.E. dimmer switch (Mod. No. D1-61D)

All materials are available at a hardware store and should not total more than \$10, if purchased new.

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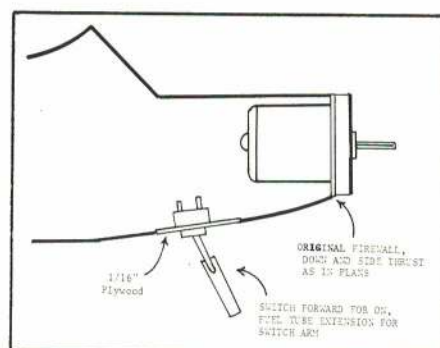
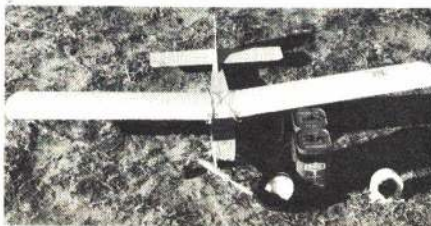
MITCH POLING ON ELECTRIC FLIGHT

Fly With Plymouth: Windshield washer motors from late model Plymouths make excellent power plants for single-channel airplanes. Mine cost \$5 at the salvage yard, and has five poles, carbon brushes, self-adjusting bearings, a mounting flange, weighs 2.5 oz., and has a sturdy shaft with plenty of length to mount a propeller. This is a 12-volt model and must be rewound. I used 35 turns (pack down the turns with a spoon handle every five turns) of No. 26 magnet wire around each two poles, as in the original windings. A six-volt washer motor may not need rewinding... this has not been tried, however.

Six GE 500 mah Permacells produce 14,000 rpm on a 4 1/2-2 Cox gray prop at four amperes drain, and 11,500 rpm on a 5 1/4-3 Top Flite nylon prop at six amperes drain. The prop hubs were drilled out to 3/16", and a 3/16" neoprene fuel tubing insert was used to press fit the propeller on the motor shaft. This provides shock protection for the motor shaft. I have spun the model in from 200 ft. with no damage to the motor with this setup (the test was not intended!). No arc suppression is needed or used with the motor.

The Dick's Dream Goes Electric: The Dick's

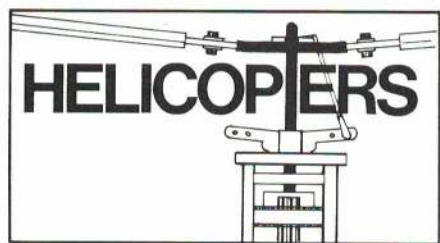
Dick's Dream goes electric... with a Plymouth motor.



Dream, sold by Ace RC, makes an excellent single-channel electric, using the rewind Plymouth motor. Flying weight is 16 oz., and the plane does rudder only loops and rolls. Flight time is four to five min. on a seven-min. charge (three ampere rate), with altitudes of up to 400 ft. The 5 1/4-3 Top Flite nylon prop is used.

The construction is stock, except for tail-dragger gear. The foam wing panels are left

(Continued on page 112)



JOHN BURKAM ON HELICOPTERS

More Toledo News: As expected, the number of helicopters at the Toledo show increased from 28 last year to 39 by actual count. Five of them were privately built, non-scale original designs; namely, Chuck Sherman's, Tom Herr's, Faye People's, and two of Dave Keats'. Two more, if you count Ed Sweeney's and Dave Keats' Superbirds.

Mike Bosch's flying demonstrations were certainly outstanding features of the show. He put the latest version of the Kavan Jet Ranger through all sorts of left turns, right turns, climbs, stall turns...and even autorotation from 75 ft. altitude down to a power recovery at about three ft. On Sunday he was to have done a power off autorotation. I unfortunately had to miss that. He was not permitted to demonstrate the loops he has been doing for the past several weeks. I did a loop myself with Square Tubie last February, so I know how it looks (more on that later).

The new Du-Bro Shark flew faster than the Hughes 300s, and had a terrific rate of climb. Wish I could have seen Ernie Huber's fantastic flying. Maybe we'll all see it in the movies one of these days, as Ernie goes to Hollywood after Toledo.

The Kalt Sangyo Co. displayed a new Bell 212 Twin Jet, 60-powered, 5+ ft. rotor, which will be out in May. It had a very clever collective pitch mixing lever on the rotor (see picture). The Hiller servo rotor was, as usual, fixed to the hub and controlled by the swashplate. The collective pitch rod came up the side of the shaft in a milled groove. Above the swashplate, it angled out and up to the end of a lever on the hub. The other end of this lever pivoted on the opposite side of the hub.

In the middle of the lever were two ears, to which the pitch links were attached. The other ends of the pitch links were tied to the blade pitch arms and served to put in collective pitch. Teetering of the gyro bar rocked the whole hub, and thus put the cyclic pitch into the main blades. I like having the paddle bar attached firmly to the hub, rather than sliding up and down. Then, in a crash, all that happens is that the paddle arms get bent, not the slider guides, as in the other arrangement.

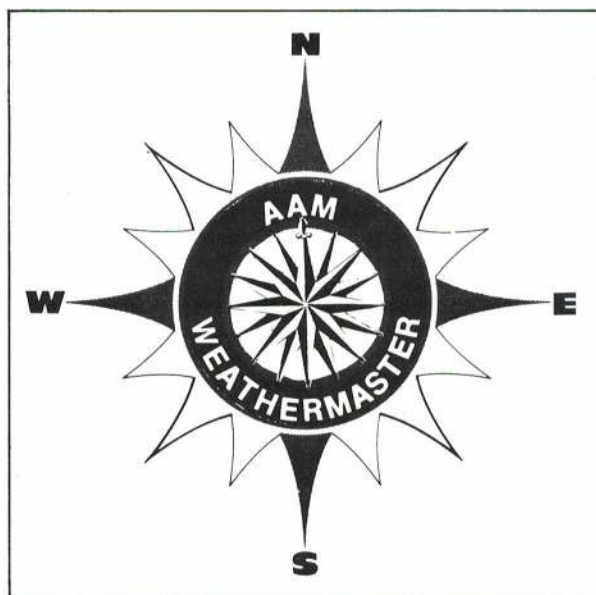
With individual pitch bearings for each blade, it is especially important to have single-bolt blade attachment, to avoid bending the pitch bearing spindles in a turnover. The Kalt did not have these. Neither did the Schluter

(Continued on page 112)

Part 1, of a three part series, slanted toward making you a weather prognosticator. This month, some basics which might tell you...

Weather to fly or not

by Hobie Steele



BELOW: A fair damsel, Marjorie Knoop, predicts fair weather with the AAM Weathermaster. The complete construction of this forecasting station will appear in the July and August issues.



How many times have you checked the local weather report, loaded plane and gear into the ol' buggy and made it out to the field, with full faith and trust in the weather report...only to find rain, a storm, wind from the wrong direction and otherwise totally rotten flying conditions? You expected a breeze from the southwest, since the free flight or glider field has high trees in that direction. A southwest wind would carry aircraft away from the obstructions and safely downwind into open spaces. You get out of the car, and the first thing that hits you is a north-east wind—straight toward the trees! You might have a similar problem if your control line circle has obstructions which require the takeoff run to go from north around to southwest (downwind, to keep the lines taut). An unexpected stiff breeze from the southwest is blowing that day, which would spell disaster for any attempted flights.

Or, suppose you make it to the RC field and, the minute you get out of the car, it's too windy to fly—trees all bending and the birds are even walking! You wish you had stayed in the workshop; but you loaded all that stuff up and made the trip, so might as well wait a while to see if the wind lays, right? Wrong! The longer you stay out, the lighter the force of the wind feels.

You're just getting used to it when some agitator (you know him, he's the guy who never flies in marginal weather, but has caused the destruction of untold numbers of aircraft by his rabble-raising) comes up with the suggestion that the wind seems to be abating. Why don't you try *your* ship! That's just what you've been waiting for. The wind hasn't died one bit, but you came out to fly, didn't you? Ignore the fact that it takes two guys to hold the plane while you fuel. Crank the engine, peak the needle valve, and off you go—briefly. Wham!

A lot of time, and no small amount of money, just spread itself all over creation. You should have stayed in bed, or at least in the workshop. As you police the rubbish and replace your divot in the sod, you try to think of some reason why the designer of the plane or radio gear might be responsible for the crash. You finally decide to blame your agitating "buddy." Forget it. It's your fault for not making a check of local weather conditions before you left the house. There should have also been good judgment used before flying.

You can get a weather report from your local newspaper, but that's usually out of date before it's even printed. Weather reports on the radio are generally more timely than the newspapers', and both can give some indication of weather front movements. Nevertheless, directions and speed can change between the time the station's news service gets the report, and the time that the station gets it on the air.

If there is a telephone weather report available in your area, it would probably be your most current source. Call Information. Where I live (Washington, D.C.), we have weather messages for local surface weather, Chesapeake

Bay marine weather, weather for aircraft pilots, plus weather for numerous major cities throughout the world! This information is listed in the phone book under National Oceanographic and Atmospheric Administration—U.S. Government; subhead, Department of Commerce! Like I said, call Information.

Weather forecasts are astonishing in their accuracy, considering the odds. If the National Weather Service (now a part of the National Oceanic and Atmospheric Administration, NOAA) predicts a 20 percent chance of rain, each day, for five days in a row, we should expect one rainy day out of the five. The problem is that the Weather Service reporting station may be many miles from your flying field, so that "local" just may not be close enough.

Let's look at some of the signs at home that give us an indication of how the flying might be at our field. Simply expressed, why not be your own weatherman?

There are lots of cliches about predicting weather which are not necessarily untrue. Sayings such as "Red sky in the morning, sailor take warning—red sky at night, sailor's delight," have some basis in fact. I'd just as soon trust my grandpappy's corns, which always seemed to predict what the weather was, rather than what it was going to be. With just a few knowledgeable observations, we can do better than adages or aching corns to decide whether to fly or not. By adding some simple instrumentation (construction details to follow next month), we can greatly increase

the accuracy of our own predictions.

What causes weather? You might just think about that question a bit before reading further. . . . At a couple of contests which I attended recently, I'm sure the weather was caused by the devil. But let's skip philosophizing and get back to science.

Weather is caused by the difference in pressure between unequal masses of air. That's the high pressure systems and low pressure systems, or "highs" and "lows" you hear the TV guys talk about. What we're interested in is the pressure differential between the high and the low. A high has somewhat higher barometric pressure than the air around it, and a low has lower pressure than the air around it. It's all relative!

Cooler air has a higher barometric pressure than warmer air, and the air flows from the higher pressure area to the lower. Let's call the results of this airflow "wind." The greater the difference in pressure, the higher the wind velocity.

In the northern hemisphere, the circulation of air is clockwise around a high, and counterclockwise around a low. This is why the wind direction shifts as a front (an invisible mountain of high—or low—pressure air) moves through. As a low approaches, the wind may be coming from the southeast. As the front passes, the wind may shift to westerly, then to northwesterly. With a relatively strong low approaching a strong high, heavy winds, turbulence, rain, or hail may be evident. Behind this front, however, you will probably find fine flying weather. The trick is to know

when the front is coming, and approximately when it will be past your flying field.

We can see these highs and lows before they affect our weather, by simply observing cloud formations around us. Clouds are tiny droplets of water, which are always present in the atmosphere. These droplets become visible due to changes in temperature at high altitudes (or at low altitudes, in the case of fog). On a perfectly clear, cloudless day, it's quite an experience to watch clouds begin to form. Seemingly out of nowhere, white puffs just appear. It's almost like magic!

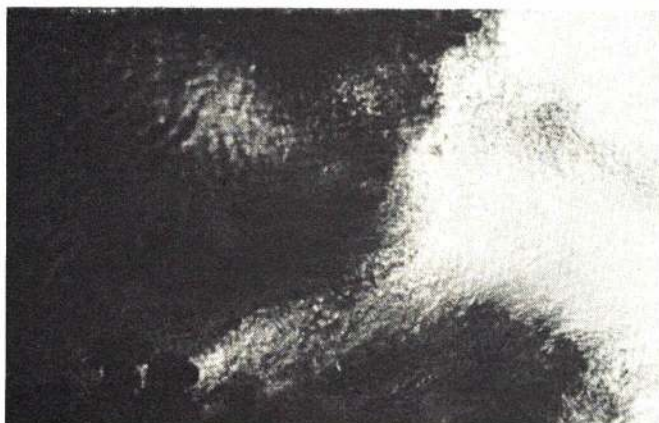
Clouds can tell us a great deal about forthcoming changes in the weather. How the clouds develop determines whether or not we may expect precipitation or storms. By simply noting a few of the more obvious cloud formations, and learning what each type has to tell us, we begin to become our own weatherman.

Cirrus clouds (Picture 1) are wispy, fibrous tufts, composed of ice crystals at high altitudes, usually above 20,000 feet. If they are stable in size and density, or if they are diminishing, we can generally depend on fine flying weather, due to cool high pressure air.

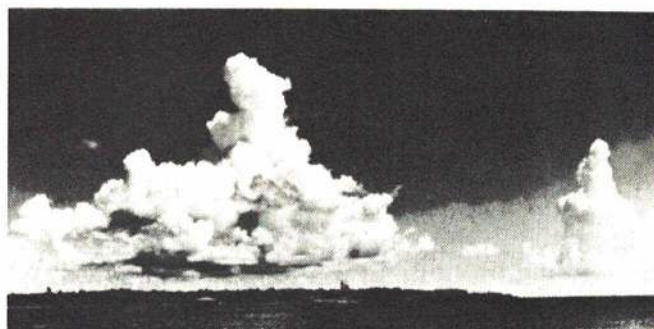
If, however, the cirrus appear to be thickening and lowering, a less stable low is moving in, with warm, moisture-laden air. These thickened clouds are cirrocumulus (Picture 2), commonly called Mare's Tail, or a Mackerel Sky. When cirrocumulus are building, you can figure on rain within about twelve hours, as the warm, moist air rises over



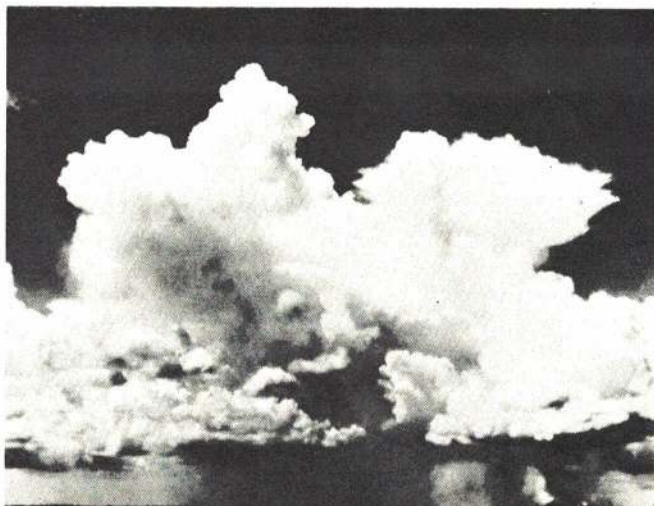
CIRRUS



CIRROCUMULUS



CUMULUS



CUMULONIMBUS

the cooler air mass, dropping its precipitation. If they are building rapidly, bad weather is imminent.

Below the high altitude cirrus and cirrocumulus clouds are, would you believe, *middle* clouds called altocumulus and altostratus formations. Although not pictured here, they are somewhat denser than cirrocumulus. If these middle clouds are thick enough, some rain may fall, but this precipitation usually evaporates before reaching the ground.

Cumulus clouds (Picture 3) are the lowest type, with an average altitude of just over 1500 feet. In a thermal, they may build up to enormous heights. That's something to look for when seeking a free flight max, or if you're a glider guider. Thermals are shafts of rising warm air, sort of an updraft, which may go as high as 20,000 feet or more. Visually, they're indicated by a column within the cumulus, puffing much higher than the rest of the cloud.

Ordinary fair-weather cumulus may look like that in Picture 3, or like big cottonball puffs scattered about. Usually found in the cool air following a cold, high pressure front, cumulus indicates fine flying weather ahead.

But look out! One type of cumulus may be a sure warning of winter storms or summer thunderstorms. When cumulonimbus (Picture 4) start to swell and boil upward (towering up to 40,000 feet like an enormous cauliflower), it could be preceding a warm, low pressure front; and is appropriately called a thunderhead. Darkening and rising cumulonimbus, if heading in your direction, are fair warning that bad weather is on its way. Within a half an hour, the situa-

tion could become severe—with rain, lightning, hail, or even the development of a tornado under certain conditions.

If you are outside when these conditions develop, and are interested in pinpointing the center of the low, face into the wind and extend your *right* hand straight out to the side (even if you're a southpaw). You are now pointing at the center of the disturbance. The wind will shift counterclockwise as the low passes, but the same rule holds true—face the wind and your extended right hand points to the storm center. This way you get some indication of how fast the storm is moving and how long it will be before good or bad flying weather may arrive. Generally the faster the storm comes up, the faster it will abate, although it could slow up, change direction, or stop.

Indoors, we need more than our senses to be our own weatherman—we need instrumentation. Not being one to introduce a problem without offering a solution, let's look into some simple instruments we can make and use for forecasting whether to fly or not.

The most important instrument is a barometer, which can be constructed from materials available from the average hobby shop. However, the complexity of mechanics and calibration are more than I care to bother with, for the few bucks a decent barometer costs.

The next most useful item is a wind direction indicator, which can be as simple as a weather vane on a pole, or a remote reading instrument, which we will show you how to construct in next month's issue. You can instantly monitor wind direction from the comfort of your easy chair or workshop.

Wind speed is vitally important to any flier. We'll show you how to build a remote-reading anemometer in a subsequent issue.

Let's look at how we can "see" the movement of highs and lows from the comfort and security inside our home. To do this we need a barometer, specifically an aneroid (non-liquid) barometer, which is generally available at a reasonable cost. It indicates barometric pressure, measured in inches of mercury. Ignore the "Change," "Fair," etc. which may be inscribed on the dial of the barometer. These are little more than decorations. Remember that the lows and highs which cause weather are *relative*, and what we want to do is to compare the *differences* in pressure. By comparing the current barometric pressure with that of some time ago (one to several hours), we can "see" a front approaching *before* the wind shifts.

Let's say our barometer has been reading 30.04 for some time and the weather has been nice. On checking, we find pressure is *down* to 29.80, indicating a lower pressure front approaching. If, after a short time, the pressure is still falling, we can assume that the low front is moving fairly rapidly, and the weather will deteriorate. A slowly "falling glass" would indicate a slower moving low, in which the weather would worsen gradually and probably be bad for a longer period of time.

Most aneroid barometers have a separate needle which can be set manually at the present indicated pressure, to compare later pressure rise and fall. Remember, it's all relative.

By now, the pressure is down to 29.25, and the wind is up and it's raining. But the needle has moved above the one you set at 29.25, indicating that the front is passing as (slightly) higher pressure moves in behind it. What do you expect the weather to be? Well, it shouldn't be long before the sun shines again and, depending on the wind, you might just have a great afternoon for flying! Just because a front moves in rapidly, however, does not necessarily mean that it will move out as rapidly, since they seem to have a will of their own. This is why the Weather Service sometimes seems to miss the boat completely, since a front may be heading in at a clearly defined direction and speed, then suddenly change course! But if the barometer is rising rapidly, you can usually depend on a fairly rapid improvement in the weather.

By comparing barometric readings and observing wind direction, we can become pretty accurate in forecasting flying weather. The following wind-barometer table was issued by ESSA (NOAA's predecessor in our government's "weather arm"), as a short-range guide for weather forecasting. It should cover most all possible wind shifts and barometric readings we may encounter throughout the United States. With this chart, and the knowledge gained from the preceding, you should have most of the basics needed to decide whether or not to make the trip to your local flying field.

WIND DIRECTION	BAROMETER REDUCED TO SEA LEVEL*	CHARACTER OF WEATHER INDICATED
SW to NW	30.10 to 30.20 and steady	Fair, with slight temperature changes for 1 to 2 days.
SW to NW	30.10 to 30.20 and rising rapidly	Fair, followed within 2 days by rain.
SW to NW	30.20 and above and stationary	Continued fair, with no decided temperature change.
SW to NW	30.20 and above and falling slowly	Slowly rising temperature and fair for 2 days.
S to SE	30.10 to 30.20 and falling slowly	Rain within 24 hours.
S to SE	30.10 to 30.20 and falling rapidly	Wind increasing in force, with rain within 12 to 24 hours.
SE to NE	30.10 to 30.20 and falling slowly	Rain in 12 to 18 hours.
SE to NE	30.10 to 30.20 and falling rapidly	Increasing wind, and rain within 12 hours.
E to NE	30.10 and above and falling slowly	In summer, with light winds, rain may not fall for several days. In winter, rain within 24 hours.
E to NE	30.10 and above and falling rapidly	In summer, rain probably within 12 to 24 hrs. In winter, rain or snow, with increasing winds, will often set in when the barometer begins to fall and the wind sets in from NE. Rain will continue 1 to 2 days.
SE to NE	30.00 or below and falling slowly	Rain, with high wind, followed within 36 hrs. by clearing, and in winter by colder.
SE to NE	30.00 or below and falling rapidly	Clearing within a few hours, and fair for several days.
S to SW	30.00 or below and rising slowly	Severe storm imminent, followed within 24 hours by clearing and in winter by colder.
S to E	29.80 or below and falling rapidly	Severe northeast gale and heavy precipitation: in winter, heavy snow, followed by a cold wave.
E to N	29.80 or below and falling rapidly	Clearing and colder.
Going to W	29.80 or below and rising rapidly	

*Subtract 1/100"/mercury for every ten feet your barometer is above sea level. For example, if your weather station is 1000 feet above sea level, subtract 1"/mercury from the listed sea level reading, i.e., 30.10 on this chart becomes 29.10 at 1000 feet.

FOR THE TENDERFOOT

Czech Glider

From Czechoslovakia, a bit of aeronautical memorabilia that has a modern flavor. A model of a hang glider that was designed almost a quarter of a century before Kitty Hawk.
by Frank H. Scott

Towards the end of the last century, the principal type of heavier-than-air flying machine to enjoy a measure of success was the hang glider. Pilots—such as the pioneer aviator Otto Lilienthal (1848-1896)—hung from the structure and exercised control by swinging their legs to change the balance of the craft. Launching the hang glider was an informal affair, whereby the pilot, carrying his craft, ran off a convenient hill, trusting that the plane would then carry him. Principal disadvantages of this form of flight were the shortness of the flight, scarcity of suitable hills and occasional abrupt landings.

Now, after being neglected for over half a century, hang gliders are enjoying a remarkable revival, accounts of which may be found in many recent magazines (see April AAM).

The little model that we present here originally appeared in the *Czechoslovakia Modelar Magazine* by Jiri Kalina. We have included this model here in the spirit of aeromodeling ecumenism, and besides, we found the model to be a heck of a lot of fun!

This Czech old timer is as basic as can be and, in these days of shortages, it is nice to note that four of these gliders can be made from two sheets of balsa: one 1/16" and one 1/32". And with the mounting energy crisis, the motive source for this model (gravity) remains abundant. There is every reason to believe that it will remain thus (*Gravity, I hope; not the energy crisis—Editor*).

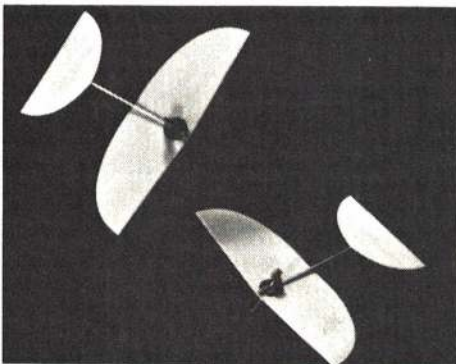
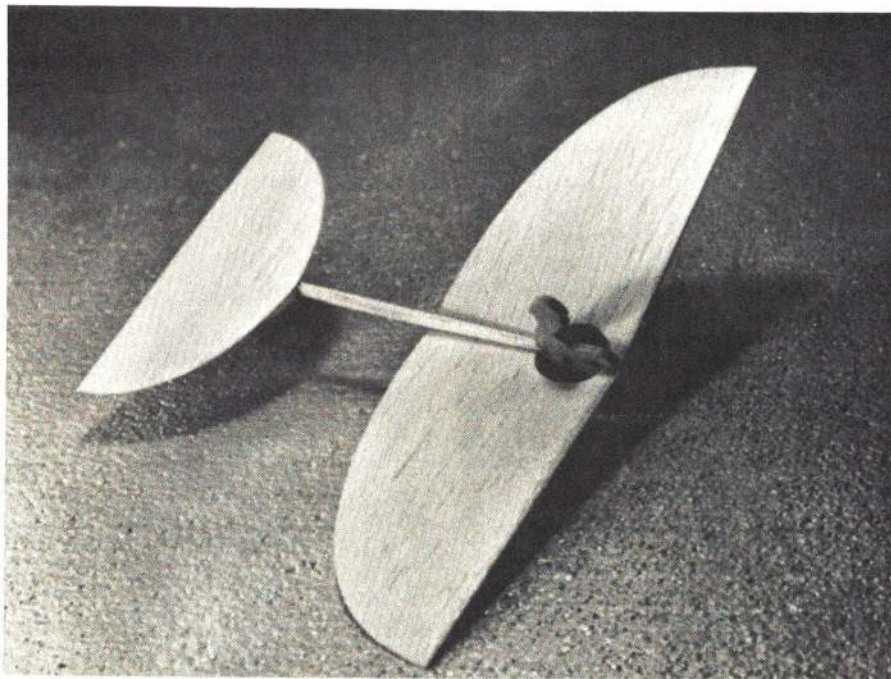
CONSTRUCTION

Construction consists in cutting the wings, fuselage and stabilizers to shape, then sanding these components smooth and gluing them together. The only tricky part is the pilot figure, which is best cut from plywood with a jig saw. But having no such saw, a coping saw can be used, or the pilot can be cut

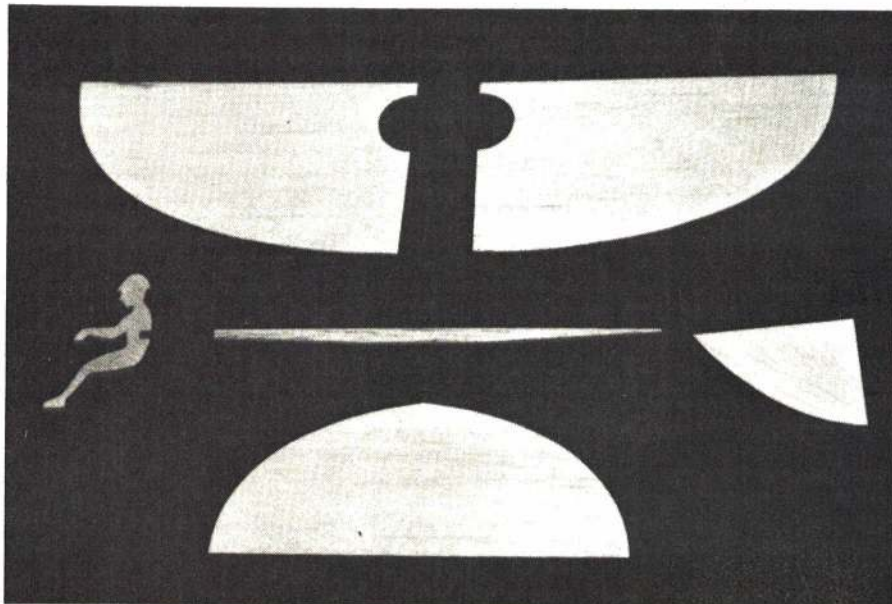
(Continued on page 97)

Materials List

1/16 x 3 x 36" Balsa Sheet
1/32 x 2 x 36" Balsa Sheet
3/32 x 3/16 x 7" Balsa Strip
Scraps of 1/8" plywood or 1/8" balsa
Glue: Titebond or wood model cement
Ballast: scrap of lead, solder, or clay



ABOVE: Suitable for either indoor or outdoor flying, the Czech Glider has surprising performance. Principles of flight are those of the real hang gliders. LEFT: Group projects stimulate fun for everyone involved. Two sheets of balsa will build four gliders. Then chuck 'em around the living room or backyard. BELOW: Six simple pieces of wood are all that's needed. Pilot figure can be made of plywood or balsa.



NOSE (FOOT!) WEIGHT

NOTE: FOR SI (i.e. METRIC)
SIZES, USE:
WINGS AND TAIL, 1 mm
FUSELAGE, 2 mm X 5 mm

WING
1/16" SHEET BALSA

NOTE: IN SIDE VIEW,
WING IS SHOWN IN
SECTION

PILOT, 1/8"
PLY WOOD
(SEE TEXT)

FUSELAGE, 3/32" X 3/16" BALSA

BALANCE
HERE

ADD WEIGHTS TO
FEET TO BALANCE
MODEL



STABILIZER
1/32" SHEET
BALSA

FIN
1/32" SHEET
BALSA

CZECH GLIDER

DESIGNED FOR MODELÁŘ BY

JIRÍ KALINA

DRAWN FOR AMERICAN

MODELER BY FRANK SCOTT

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TO USE, LAY ONE
WING FLAT, PROP
UP OTHER WING
WITH GAUGE UNTIL
GLUE DRIES

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316 1-5/8" dia.
317 1-7/8" dia.
319 2-3/8" dia.



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axle hole may be drilled larger.
307 Smooth 7/8"
308 Treaded 1"
309 Smooth 1-1/8"
310 Treaded 1-1/4"
311 Smooth 1-3/8"
312 Treaded 1-1/2"



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322 3" dia.



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REPORT FROM NUREMBERG

(Continued from page 10)

able to fulfill my first requirement—to learn on someone else's machine! Anyway, I hope I've used the correct words to describe the new rotor, since Fritz Bosch, Simprop's manager, explained it in very good English. Thus, I can't blame my mistakes on the language problem.

RADIOS

Two new RC radio sets came into the German market by Rowan and Brand. Both sets were Frequency Modulation (FM) for the RF but, of course, used standard digital coding. The FM has the very real advantage of being more free from interference than the normal Amplitude Modulation (AM) systems. Rowan demonstrated how the FM signal would punch through to a receiver, even though an AM transmitter on the same frequency was close-by. The FM set is legal in Germany, and may see much use, if the claimed frequency spacing of 10 kHz works out in practice. The emitted band width is ± 2.5 kHz, so it may be possible for them to slip new channels between the existing 20 kHz RC frequency spacings. Germany does not have the 72 MHz band, so they must make maximum use of the 27 MHz band, where they already have 12 channels. It should be noted that American FCC regulations do not permit FM for RC use. However, that requirement is a holdover from the original FCC/RC regulations of 20 years ago, when FM wasn't even considered as feasible for RC. If the FM proves itself more reliable in the European systems, the USA should take a good look at changing the FCC regulations. Oh yes, the FM set price goes up \$75.00 over that of the same AM set. The Rowan radio is called Prop-Control and the Brand unit is called Microprop.

Another radio which is new is the Contest, a professional version of the Simprop Alpha 2007 series. It is a deluxe set, built especially for the serious contest flier. In fact, the prototype models were flown at the Gorizia RC World Championships by Wolfgang Matt (2nd place) and Hanno Prettnner (3rd place). The set features electronic trim pots and selector switches, which electronically limit the throw of the ailerons

and elevator to smaller (but adjustable) values. This permits the flier to tailor the maximum servo deflection to a value best suited to the maneuver. Thus, he has available a "large" deflection limit and a "small" deflection limit, and can switch between them at will during the pattern flight. The components are all carefully selected and tested for this quality set, which is tested for several hours before it is ready for delivery. The price? Something over \$700.00. It's in production and selling well.

POWER PLANES

Always expected from Nuremberg are new RC planes, and this year was no exception—the designs spanned from trainers to twin-engine scale jobs.

The Britten-Norman Islander, which won the 1972 RC Scale event at the British NATS for Roy Norris, has been kitted by Tenco of Belgium. And it's a beauty. High wing, seven ft. span, two 40 engines, full-house controls and flaps. The all-balsa kit has been designed by Leon Janssens, contains many pre-fabbed parts, and includes the wheels and tanks. At a price of \$195.00, it should be complete! It's really different, and should be an easy flyer. We think Phil Cohen of Tenco has picked a good one.

The Bolkow 209 Monsun, by Graupner, is a scale-type RC plane which falls into the Stand-off Scale category. The Monsun is a two-place, low-wing sport plane, with trike gear. This has been carried out in a 62" span model, powered by a 40 engine. Pre-

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Cassutt Special as control line beauty modeled by Frank Beatty. Spans 29 inches; 34 inches long; scaled 2-3/16" to foot. For .35-size powerplant.

Group Plan #366 6 oz. \$1.20

"Propo-Cat" by Bud Atkinson for Class Two radioplane events. Spans 61", length 47 1/2", takes .45-size engine.

"Little Lindy" by Larry Conover for Class Half-A and Class A free flight competition with .049 or .051 power. Spans 52", 290 sq. in. wing area.

Jim Triggs models the famous Knight Twister for .010 cubic inch motors. Spans 10 1/4", length 9 1/2".

Chilton D.W.1A control line scale gem by Frank Beatty. English lightplane takes .35-size powerplant. Spans 42 1/2", length 34".

Group Plan #766 6 oz. \$1.20

"Windmill" radio-controlled lovely by Dallas Armstrong, Jr. Takes .45-size power for competition flying. .35-size for Sunday flyers.

Spitfire Mark 8—World War Two—king-size control line scale by Walter Musciano.

Group Plan #364 3 oz. 70 cents

"Tony" scale-like stunt model by England's outstanding designer, Frank Lee Worburton. Realistic Jap fighter-like Ukie spans 57"; length 40"; takes .35 engine. Sure to bring you top appearance points.

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fabbed wings and tail (foam and wood) should save considerable construction time. The squarish body lends itself to balsa sides, which are pre-cut and pre-reinforced. A plastic molded cowl and seats save time, too. The nose wheel is steerable, and can be retracted, as in the original. The use of ailerons is optional.

Another model from Graupner is the Maxi advanced trainer, designed by the Chief Engineer, Fred Militky. It's a 63" span, high-wing model, for a 40 engine, and is quite stunnable, as well as easy to fly. Considerable prefabricating of the flying surfaces and body make this ship a fast builder. The wood covered foam wing is constructed so that the tips can be easily sawn off to fit into the smallest car trunk—a real consideration in these days of fuel crisis and small cars. We modelers must make our sacrifices too, even if it increases the wing loading a bit! The semi-symmetrical winged Maxi is definitely a step beyond the usual flat-bottomed trainers.

Skylab is a novel 60-powered trainer from Hegi, which has a shoulder wing with 2° negative dihedral in each panel. It is claimed to be fully stunnable, but still docile and slow on the landing approach. "Hands off" inverted flight requires only a touch of down-trim, according to the designer, Hans Ludwig. The fuselage is fiberglass. The built-up wing is 65" in span and, due to its efficiency, needs a very slow running engine to bring it down for a landing. When you bring this plane to the field, the local "experts" will claim that your wing is upside down!

And for the biplane fans, Wik Models has the Super Tiger, which is claimed to be fully stunnable. It is 60 powered, and has a span of 60". The construction is mostly balsa, with a few vacuum-formed parts, such as the cowl. This biplane has been tested through the full FAI pattern by expert Wolfgang Matt, who took second place at the 1973 RC World Championships. It should be a good subject for Jerry Nelson's biplane category.

Multiplex has brought out a large power model, called Big Lift, intended to satisfy the need for a docile plane for towing RC gliders. Glider towing has become popular in Germany and is now a recognized contest event. Big Lift is a handsome, high wing cabin model, which weighs in at eight lb., with a seven ft. span. A 60 Webra pulls it steadily and slowly, so that the gliders are not over-stressed. Here is a power plane that should interest even the purest of glider pilots.

GLIDERS

So many RC gliders have been brought out in recent years, it would seem that new ones would be scarce; but a few made a showing this year.

The prefab Deddy by Rowan is a 92" span glider with a polyester body. The wings are foam, and are covered with a tough vinyl film instead of the usual balsa. It claims to be good for both thermal and slope soaring. As a prefab glider, it should assemble quickly and fly well at a weight of 2½ lb. Cost in Germany is about \$50.00.

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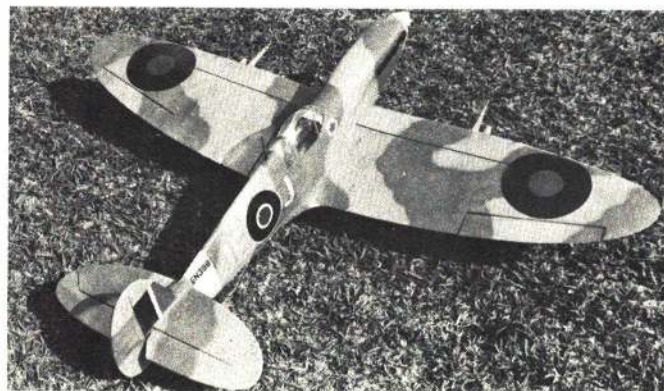
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A-6

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The Carrera Co. of Nuremberg had three completely new Draco gliders, with wingspans from 92" to 118". The smallest was for stunt flying, which is a contest category in Germany. The other two were for slope and thermal tasks. My eye was attracted to the largest one, which carried a small electric power pod above the wing. Apparently Carrera has taken the power plant from their small electric free flight plane and adapted it to the glider. These gliders were so new that no brochures existed at the booth, so it was not possible (even with my slow German questions) to learn anything. It is estimated that the motor run is only a minute or two. Charging from a four pack of D-cells, in five minutes, was claimed. I expect we'll be hearing more about the Draco gliders, and their electric power pods, in the future.

Ever since coming to Germany a year ago, I've been fascinated by the IBA prefab gliders from Essen. They have balsa bodies and balsa covered foam surfaces. All you have to do is install the RC gear, and put a protective coating on the balsa. For a small extra charge, they even come lacquered! The spans vary from 80" to 130", and there are several types of bodies. One of these gliders placed well in the 1971 International FAI RC Glider Meet at Doylestown. Cost in Germany is around \$100.00.

Two accessories may be of interest to the glider fans. One is a set of prefab spoilers, which set into the top of the

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wings, and are operated by pushrods emerging from the root rib into the fuselage. They pop up vertically from the top of the wing, to spoil the air flow and markedly reduce the L/D ratio. KDH makes these plastic spoilers and has priced them at \$6.50 a pair. This type of spoiler has been observed to be very effective in aiding spot landings, and has almost no effect on trim settings in pitch.

The other accessory was a self-winding tow reel by Schuco. It's intended for hand-towing, and takes the form of a three-ft. hollow tube, with the reel mounted coaxially on the end of the tube. Inside the tube is a rubber band, which is wound up as the line is pulled off the reel. Then the model is

towed up by the tower running with the tube in hand. After the model releases from the line, the rubber band spins the reel, and rewinds the line before the parachute hits the ground. I haven't seen this demonstrated, but it sounds like a good trick.

ELECTRIC-POWERED RC

Several additions to the electric-powered RC stable appeared this year, in an attempt to compete with the Graupner Hi-Fly model, which hit the show last year.

Multiplex now has a pusher electric-powered glider called the E 2. It is a conventional T-tail design, with a large pusher prop at the extreme tail of the fuselage. The Mabuchi electric motor is

mounted forward near the CG. The span is 63", and the total weight (with radio and electric power) is listed as 1¼ lb. We questioned the surprisingly light weight, and it was confirmed. So we must conclude that the model must be of very light construction, and that the electric motor and battery were selected for rather short runs. Charging time is stated as eight minutes. Perhaps we're seeing a trend for gliders with short motor runs of several minutes, rather than the ten minutes or more for the Hi-Fly.

MISCELLANEOUS

One of the cleverest innovations at the show was also the smallest. Graupner's "servo reversing cable" is a simple

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solution to a common problem. Have you ever finished up a new plane, only to find that one of the controls is backward? With the Graupner system, you just slip the new cable in series with the normal servo cable and the servo becomes reversed! We should persuade our American RC companies to offer such a nice item.

Another Graupner accessory is their new electric starter, especially designed for starting helicopters, but also excellent for prop engines. It works on 12 volts and is rated at .2 hp. The motor comes from the well known Bosch electric company.

New, to me, was the Simprop/Kavan gyroscope, which is used in helicopters

to tame the yaw axis (vertical axis). For newcomers, once the yaw axis is held steady by the gyro, then the roll and pitch axes are easier to control. It is claimed that, with two of the gyro units, the helicopter can be hovered "hands-off!" The gyro unit is a two-inch cube, weighing about three oz. It contains an electric motor, which spins two brass discs to give the gyro action. The output of the gyro is electrically connected to the appropriate control servo. Cost is about \$40.00 each.

I'm sure that some important items at the Nuremberg Toy Fair have been missed. Others have been intentionally omitted, such as Kraft Europe, Cox, Revell, Comet and others from America. Some newcomers, such as the Czecho-

slovakians, are beginning to exhibit model supplies.

The prices stated in this report are current ones in Germany, and will be higher in the export market. Of course, there is also the highly variable dollar/deutschmark ratio—so don't blame your dealer for all of that increased price tag.

Overall, it was so impressive a show that it would be impossible to absorb everything, even if one spent the entire week at the job. At the same time, one can't help but spend a little time in historic Nuremberg, viewing the old walled city with its shops and fine restaurants. While you're walking in the old city, be sure to drop by the excellent model shop at 43 Jacob Strasse. The owner, Wolfgang Soergel, is an old-timer mod-

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0242/PAZMANY PL-1—Scale EAA home-built aircraft model by Nick Zirolli. Features include all-moving stab, balsa construction and a 45 size engine. Two detailed plan sheets. **\$6.00**

0141/SHRIKE—Fabulous RC Pattern ship designed by pylon champ Bob Violett is very smooth, fast flyer. Design is intended for fiberglass fuse, foam wing, retracts and a hot 60. **\$4.50**

0142/FAIRY UNLIMITED—Rubber FF design with lightweight construction for good performance. Features many innovations. **\$3.50**

0143/METEOR MK8—CL Scale model uses unique ducted fans (2) and 40 size engines. Text and plans explain fan construction. Large ship has 58-in. wingspan, 66-in. length and weighs 12-13 lb. **\$6.00**

1231/T-19 TRAINER—CL Tenderfoot design has flat fuselage for easy construction and a unique removable wing and tank. 36-in. span, for 19 to 25 size engines. Special price. **\$1.00**

1232/FAIREY BARRACUDA—Unusual-looking Scale FF project is rubber-powered. Stick and tissue construction. Good flying characteristics. 35-in. span. **\$2.50**

1131/ELECTRA-FLI—Easy-to-build Sport ship is electric-powered for fun, quiet flying. Ship is designed for use with the Astro-10 motor. **\$4.00**

1132/FAIREY FIREFLY—Dave Platt's four-view scale drawings of a proposed Nats level Scale project. The drawings do not contain construction information, but are well-detailed for scale assistance. **\$3.00**

1031/WARLORD—This great RC ship was designed to win in FAI competition. With a 61 the Warlord becomes a highly competitive plane. **\$4.25**

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0734/CRITTER—Marblehead Class racing yacht by Victor Miglierina has an all built up construction. 50-in. length, hull is built inverted. Xerox copies of drawings accompanying article available for 50 cents each. List drawing by figure number and order through plans service manager. **\$3.50**

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0333/CURTISS ROBIN—Rubber scale model for AMA events. Easy flying. Stick and tissue. Square shape builds easily. \$2.00.

0231/MUSTUNT I—Primary profile fuselage, upright 35 engine, thick airfoil stunt trainer. By Al Rabe. \$2.25.

0232/MUSTUNT II—Advanced stunt trainer, same aerodynamics as Mustunt I but fully shaped fuselage and upright 35 engine capable of winning any meet. \$2.75.

0233/MUSTUNT III—Nats-level 35-powered non-scale competition CL stunter is exactly like Mustunt II but has many detail refinements and tapered wing. \$1.00. You'll need 0232 for complete construction details, order separately.

0234/SUPER GOOSE—Very unusual flying wing RC has swept forward wings for better flying, balance, and construction. Uses a 40, stunts real well for fun flying. \$3.75.

0133/MO-BIPE—Contest-winning Navy Carrier profile fuselage biplane. Thin wings go fast and slow. Takes a throttled 35. \$1.75.

0132/VIPER—Toledo Design and Finish winner, big State-of-the-Art Pattern ship by Dario Brisighella, Sr. for good 60s and retracts. \$2.00.

0131/720 TURN—Clarence Haught design Class B FF. Conventional design, high pylon wing, big plan. \$4.00.

1224/SNOOPY—Sport flyer and trainer for 09 thru 35. Can use Top Flite Headmaster wing. \$2.25.

1223/QUICKY 500—Glen Spickler's club pylon racer goes fast but is very quick-building, long-lasting, easy to fly and land. For TR type 40s. Great for grass-field sites. \$2.75.

1222/DAVID—An Al Nordic for competition with A2s is stronger, smaller, easier to make, and has lower wing loading. \$1.75.

eler. Besides showing you his modeling wares, he will also give you pointers on shopping, sightseeing and eating in Nuremberg.

Meeting old friends like Soergel made the fair seem more like a family reunion than a show. It was difficult to tear away from visiting to push on to the next exhibit. Joyce and I didn't realize that we would see so many of the European friends we've met at RC World Championships, and from my earlier years on the International Model Committee (CIAM). That part of the fair was most pleasant. We expected to see more Americans at the fair, but ran into only one. That was the "number one" model plane booster from the USA—Nat Polk, from Polk's Hobby in NYC. He's an old-timer at the trade fair business, and still promotes modeling with great vigor.

We hope we've given you a brief glimpse of the world famous Nuremberg Toy Fair but someday you must see it for yourself. We'll meet you there for some famous Nuremberg bratwurst, and a glass of cool German beer!

ON THE SCENE

(Continued from page 12)

With the support of major contributions from Kraft, Sig, Midwest Distributors, and Sterling, plus many sets of plans donated by DCR members, and an extensive set of glider plans from Dale Willoughby, Husnu Tekinay set the Model Aircraft School on a new course. The author, then living in Ankara, worked closely with the THK group. I helped with some points of construction and installation peculiar to RC gear, and with basic and aerobatic flight training.

With an almost perfect setting of broad runways, unobstructed approaches, and large areas of tall grass (ideal for cushioning those inevitable smashups), Etimesgut airfield soon became busier with RC flying on weekends than with full-size aircraft. Turkish and American modelers, and often their families, enjoyed the lovely shaded garden picnic area next to the THK buildings. By the fall of 1972, the kind of hard-core devotee seen in a few places throughout the world had also appeared in Turkey...flying in the rain...bucking any wind...skidding through slush and snow in a tradition only mailmen can appreciate!

Gungor Arel is an Ankara construction engineer and an experienced RC glider pilot. As a consequence of having lived in Germany for several years, he rapidly became proficient with the quick, slick pattern planes, and began using his backup ship, an Ugly Stik, to teach others. Bulent Mutlugil, an electronics student at Middle East Technical University, built his own RC gear from Fred Marks' AAM articles on the Digital Commander. He was soon duplicating receivers and servos for his friends. Semih Aksay calculated all the aerodynamic formulas for a mid-wing model, adapted from old magazine plans. It flew beautifully and steadily from the very first flight...fast and

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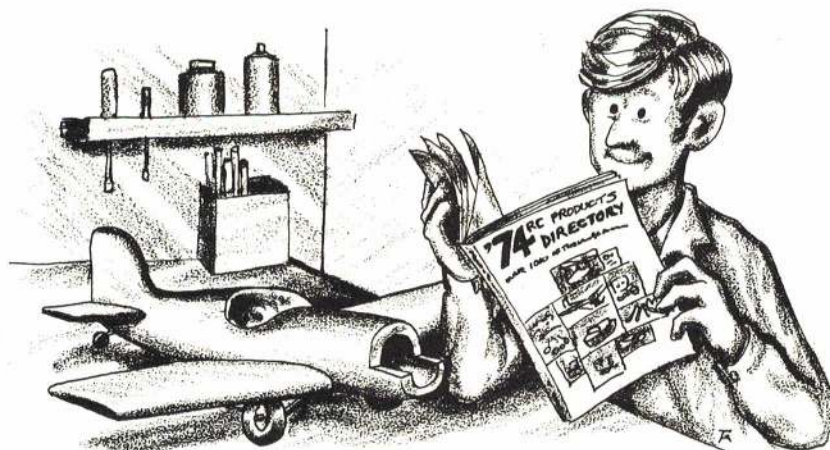
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true, as designed...but his nerves
caught up with him later on!

USAF Sgt. Jim Dalton was one of
the first Americans to fly with the THK,
and turned out a number of interesting
planes, several beautifully decorated by
his wife Laura. Rick Alter bounced back
after a series of near disasters, finally to
declare that RC really *was* fun, and not
just the messy work of patching up
pieces. He had lots of companionship
and sympathy from Rich Morgah, who
once buried his Sterling Fledgling 10 in.
straight into the mud...pulled it out
...sloshed it clean in a puddle...and
flew merrily on. Col. Hank Smith and
his two sons started successfully with an
OS Max 30-powered deBolt Super Cub:
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down in the wind!

Near the Mediterranean coast, the
Incirlik Common Defense Installation is
home for a number of American
families. Captain Harper C. "Dan"
Daniell heads a very active group of
modelers there. In March 1973, the In-
cirlik Sultans hosted some of the
Ankara group for a Fun-Fly. The events
included loops, spins, differential speed,
and spot landings. John Fuqua flew a
brand-new Veco 61 straight out of the
plane, losing a few vital parts in the pro-
cess. No one who saw it can forget
Daniell's OS 40-powered Little Stik,
with its fantastic roll and tumble (spin?)
rate!

In Ankara, the THK school painted
their Sig Piper Cub in the official
Turkish colors and made it part of their
touring demonstrations. A Falcon 56
with ailerons, their initial aerobatic
trainer, was so popular that THK scaled
it up more than three-fold. They modi-
fied the lower fuselage to carry six mini-
ature parachutists. With a wingspan of
about 16 ft., weighing 22 lb., power was
something of a problem. The THK had,
at that time, nothing larger than a Fox
36. With two of these installed, the huge
model flew reasonably well, but had
fuel feed problems. To simplify matters,



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THK put one Fox 36 in the nose and successfully flew it!

The high point of the summer came during Turkish Youth and Sports Week, when THK hosted an RC Jamboree. The meet was designed primarily to bring together, for the first time, all who had been working with RC, regardless of age or experience. There was plenty of time for sport flying, in addition to a schedule of events in which almost any RC plane could take part. Gungor Arel and the author organized and directed a well-advertised program, which drew well over 2000 spectators during the weekend.

One of the great crowd pleasers was the Triple Threat: with aircraft and

equipment ready on a line, pilots ran a 50-yd. dash, started motors, put their planes through three maneuvers and landed as quickly as possible. Many were a bit timid about entering events, but as the spirit of fun and good fellowship bubbled up, more signed up for competition. Some had never flown RC in the presence of relative strangers before.

The Istanbul modelers had come in several vans, and they brought a number of fine scale and semi-scale aircraft. Fuat Korkmaz and Mehmet Kapanali participated in almost every event, and won or placed in several. A Smog Hog was flown by Ohannes Kalayciyan, who has developed a graceful pirouette-plus-

tango shuffle to keep track of the plane as he flies directly overhead. Atilla Tanyu and Yalcin Tungar also got in some fine flights.

Balloon bursting, with its deceptive simplicity, was a favorite, and thermal soaring brought out some magnificent and finely finished gliders, including a Cumulus and Cirrus. Quarter Midget Racing was a popular event, though premature crashes and motor problems plagued the few who tried it. The Limited FAI Pattern event had only a few participants, since it was a bit more complex. It was designed to introduce newcomers to truly competitive flying. Hundreds of spectators followed the pattern descriptions coming over the PA

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The wildest and most uproarious event turned out to be the Bomb Drop. All had trouble keeping the little bombs attached to anything that would fly. And, once that was solved, it was more trouble getting them to fall off! But as confidence and skill grew, so did the number of planes in the air at one time. There were very few frequency duplications, so as many as eight could fly at once. It became impossible to maintain the paced schedule for this contest, as pilots scrambled to get in as many flights as possible.

Hairbreadth misses over the target area had the crowd of hundreds cheering on its feet: planes converged, shivered and spun, and passed on without mishap, as luck would have it. The eventual winner, Mehmet Kapancali, literally brought his Kwik-Fli to a dead stop in the air directly over target center, making the model fall over backward to release the bomb.

The weeks that followed showed that the Jamboree had left a feeling of satisfied comradeship, so important to a healthy sport: radio control had become a solid part of aeromodeling in Turkey.

BIG BOY

(Continued from page 65)

(without forgetting anything) to returning with (hopefully) undamaged models. This gives excellent results for a rela-

tively low number of flights—I made only about 40 flights with Big Boy IV between the Munich contest and the first round of the World Champs, all of them at Wiener Neustadt.

Let's turn to the conception of Big Boy. The original design was rather progressive for its period, with an aspect ratio of 8:5 and a tail moment of 26 in. A lot of thought was put into details.

The high thrust line design was chosen because it offered a fast and stable climb, without having to resort to autorudder and autostab. In 1960, I regarded both autorudder and autostab as devices detrimental to contest reliability. The high thrust line arrangement offers the advantage of the thrust line passing approximately through the centers of gravity and drag, thus reducing looping tendencies. Usually, increased drag, due to the prop slip stream passing over the wing center section, is quoted as the main disadvantage of a high thrust design. This is true, but for partial compensation, the tailboom, most of the stab and underslung fin are out of the slipstream. Such a model gets as high as a conventional design of similar parameters. The higher CG proved to be a definite advantage in the glide.

The wings are conventional and straightforward, except perhaps for the tongue joint. This adds a lot of work and weight (which does not matter, being near the CG), but offers a combination of elasticity and rigidity ex-

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actly as it is needed. The NACA 4409 airfoil was chosen as a compromise, and was originally also used for the stab. It gives good overall results, without any structural problems. The nonsheeted wing was found to have a slightly better glide and markedly better glide stability, as well as better thermaling abilities. This is no doubt due to the lower critical Reynolds' Number of the tissue covered wing.

The fuselage structure represents a personal solution to achieving the goals of structural integrity, stiffness of the boom in the vertical plane, a certain elasticity in the horizontal, low frontal area, ability to land without ground

looping, distribution of lateral areas (side areas), and finally—it should not look too ugly. It seems to have worked out, with the 12-year-old Big Boy II still contest-worthy after over 60 contests. The original Big Boy I fuselage is still in the basement.

The idea of good "maintenance characteristics," while being part of the reliability concept, was carried out in full with Big Boy IV. Engine, tank, timer and the V.I.T. lever are easily removable for inspection, all being fastened with screws. All fuel tubing is easily accessible, as are the flood-off valve and fuel filter. Cowling and streamlining are fine, as long as no potential trouble spot is

hidden from view. In this respect, all high powered free flight models are unforgiving.

If I would have to employ autorudder and autostab to obtain the full potential of the more powerful engines available, I did not intend to trade off reliability and flexibility. Here it pays to work really carefully. If you succeed in getting the gadgets to work without unwanted play or sticking, trimming is relatively easy, since climb and glide are treated separately. All that is needed for adjusting is a small screwdriver and a wrench for the counter nuts.

By the way, Big Boy is a prop saver. Usually, you only break props when

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On the left, Paul (Captain Crunch) Christensen, new owner and president of J & J Industries. On the right, shop foreman, Tex Stinnett.



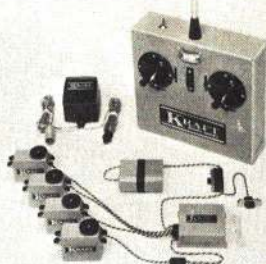
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stalling into the ground or crashing under power. I have been flying on a single fiberglass prop for two years. At \$3 apiece, this could add up to that new Rossi 15 for next season!

The flight pattern of the original Big Boy IV is an almost vertical climb, with one half to one turn to the left and a flick roll transition to the glide. The radius of the left glide circles should be set up to taste (50-100 ft. on an average). It helps to heave the model up as mightily as possible—not only does it add precious height, but it also stabilizes the initial, relatively slow portion of the climb. Big Boy is not at all vicious in respect to slightly wrong adjustment—it merely does not get as high as it could. When trimmed properly, it will climb to the left or to the right without any change, depending only on launch attitude. Transition from a climb to the right is erratic, however, even with a glide to the right—you may lose 50 ft. or more. With the CG at 77% (as was the original Big Boy IV), adjustment for an optimal climb is rather tricky, although there is little danger of crashes. Constant readjusting of the autorudder, often as little as .01" at a time, may be necessary. If you know your model and its response to changing conditions, trimming flights between rounds are superfluous. You only have to remember the conditions of the preceding flight as a reference.

With the CG at 72-75%, trimming should be easier. A certain amount of left thrust (start with 1°) is useful. Ad-

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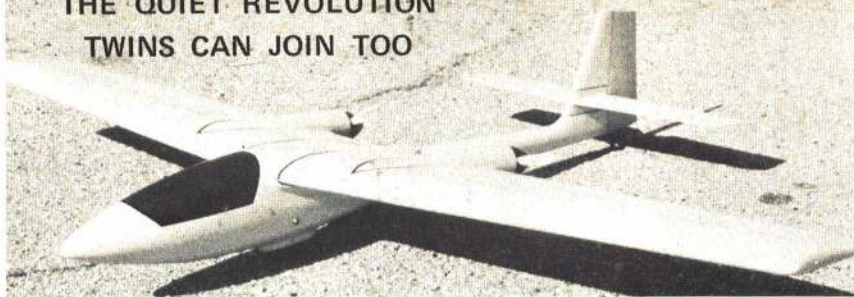
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just the glide for convenient lefthand circles. When heaved chuck-glider style to the left, Big Boy should go up to about 25 ft., recover and fly on for a good 20 sec. on its glide setting. Use an old prop for this, since "hard landings" may occur.

For initial power trimming, give the model about 1/4" right turn, taking the glide setting as reference. The stab should be about 1/8" down from glide position. For the first flight, with engine at full speed, a one and a half to two sec. engine run and four to six sec. DT are safe. Heave hard at about 60°, and slightly to the left. The (usual) sequence of the "gadgets" operation is autorud-

der, engine flood-off, autostab. Only your skill will find the optimum combination.

Power run should be increased by one sec. or less at a time, and not until you are certain that nothing will "happen." Fine adjustment of the glide on less than a five sec. power run is virtually useless. Also, transition is dependent on length of power run, readjustment being necessary when going down from ten to eight sec., then six, and finally four sec. in the FAI flyoffs (you need more climb incidence and earlier autorudder for shorter runs).

A correctly trimmed Big Boy is virtually stallproof in the glide. The left

inner wing panel should have a wash-in of about 3/32", while both outer panels are washed out about 1/16". A slight stab tilt for left circling may be of advantage. Usually, it will be sufficient to alter only the glide turn radius in order to adapt the glide to varying conditions. The original Big Boy IV goes straight, or even slightly to the right, in down-draughts, while taking on and holding weak or medium thermals very nicely. In strong lift, it will not climb as quickly as other models.

Finally, let me remark that I used to carry out three complete checks before every contest flight, and at least two before every other flight. The first check,

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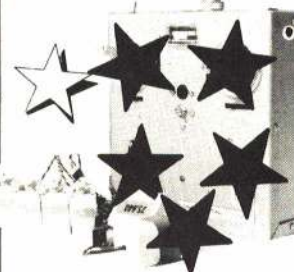


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CONSTRUCTION

As the plan contains a lot of information and virtually all material specification and dimensions, study it carefully before beginning actual work. For most of the joints, white P.V.A.

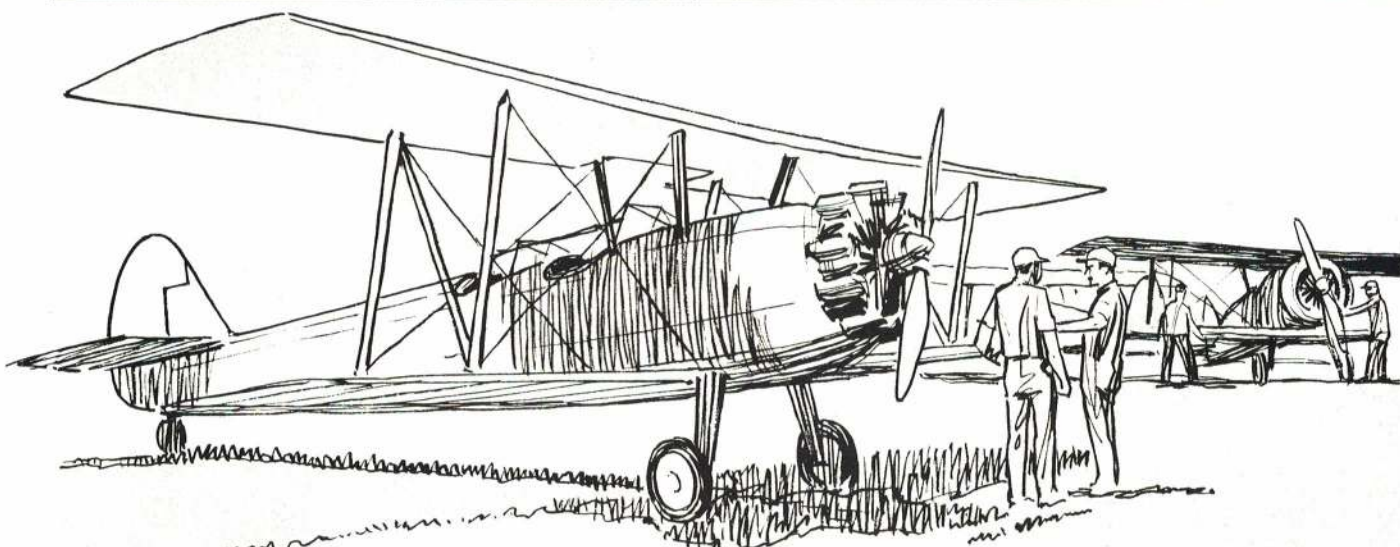
glue is perfect. In some cases, epoxy resin is preferable (see drawing). Use your experience.

Let's start with the wing. First, cut out all LE, TE and spars. Note that the spars change from spruce to balsa. The ribs of the outer panels are cut and sanded from balsa strips clamped between ply templates (ribs No. 6 and 15). Assemble the tongue box. Start assembly of wing by pinning down LE and TE, then glue in ribs. When dry, slide in tongue box and glue carefully, then slide spars into place and glue. Let dry overnight.

Next, fit in and glue spar webs, then sheeting (inner panels) and tips (outer

panels). When dry, sand all panels to shape and epoxy on the 1/32" aluminum root ribs, rubber band hooks. Finally glue in the false ribs (for the outer panel, these are best cut slightly oversize, with the corresponding next larger rib as a template). Sand to final shape. The last operation is the joining of inner and outer panels, including the dihedral braces and break rib (No. 7).

Apply one or two layers of thin clear dope to the structure, and finish with fine sanding paper before covering. For covering, medium weight silkspar is applied with cellulose glue. When dry, two coats of clear dope are necessary before applying the trim and lettering.



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In all, four to eight coats of clear dope (depending on type of dope) are needed before you can affix the glass fibers on the upper and lower surfaces for torsional rigidity and strength. Glue on with thinners. To finish wing, apply a single coat of a fuelproofers.

The stab is made in a similar manner. Try to get it as light as possible (3/4 oz. or less). It is a good idea to have two identical stabs, as this is the most vulnerable part of the model. I prefer to transport the two stabs on a simple flat board jig, and to protect them with foam panels shaped to fit over the upper surfaces. To obtain a light yet sufficiently strong structure, it is helpful to select the balsa with care, to save on glue, to use as light japtissue as you can obtain, and to dope with thinned dope and fuelproofers. Here, too, glass helps to improve torsional rigidity, making geodetic ribs superfluous.

Construction of the fuselage begins by cutting out and putting together the

crutch. Add the longerons, engine bearers and pylon framework. Prebend and epoxy in the thin-walled aluminum tubes for autorudder, autostab, DT and flood-off lines. When set, add the boom "bulkheads," and glue on the boom sides by sliding the ends of the tubes into the prepared holes. Add pylon sides, including the engine bay cover, and the root ribs (No. 0). Cut out holes for the timer and tank. Epoxy and screw on the tongue (make sure it retains the correct position) and engine mount. On the tail, fit fin parts and stab rest. When all is dry, sand fuselage to shape (see sections).

Prepare V.I.T. lever, spring and rudder stops. Cut out the rudder and glue in the ply plates inside the boom sides to strengthen the V.I.T. lever axle holes. Close all aluminum tube ends with balsa cement.

Apply two coats of clear dope or sanding sealer to the entire fuselage, sanding between coats. Cover with

either thin silkspan, lightweight silk, or lightweight glass cloth (max. weight .07 oz. per sq. ft.). The first two can be applied with clear dope, but use thinned epoxy resin for the glass. On the silkspan or silk, three to six further coats of clear dope (or sanding sealer) are required before the final coat of fuelproofers can be applied.

Remove cement drops from tube ends, and fit links as per drawing. Install the timer (links shown are arranged for Seelig timer). Install tank, engine, and fuel and pressure tubing, including a fuel filter in the fuel line. If you cannot obtain a flood-off valve, modify the arrangement to take a fuel tubing "squeeze-release" system. Finally, rig all your links to operate without undue play and stress. This rigging may take several hours, but it will pay off.

With careful balsa choosing and high quality work, Big Boy IV should come out at 25-26 oz. ready-to-fly, including a Rossi 15. In the drawing, the compo-

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ment weights correspond to the Big Boy IV original, which incidentally is overweight at 28 oz. Minimum weight for FAI will be 27.1 oz. at 595 sq. in. total area. Make sure that the CG is in the 72-75% bracket and add lead as necessary. There is sufficient space behind the engine, under the engine mount for some lead. The timer compartment can also hold some lead.

Your Big Boy is ready to fly. Good luck and many maxes!

OSKER

(Continued from page 27)

FLYING

On your first run, do low speed taxis. Occasionally get up on the step and do high speed taxis to get used to the water handling characteristics. Now, if you are as itchy as I usually am (there is a limit to a man's patience: about 1/4 tank!), push the throttle lever. Pull the stick back until she is on the step, then back to neutral. Hang on as speed builds up, and then lift her off. If you are interested in a larger aircraft, then add 10% to all dimensions, except the hull width, and you will have a 60-sized machine.

I have built several of the larger version, and they are really outstanding performers. There are more of the "stretched" versions being flown in our club, than the original 40 size (probably because there are more 60s in our group).

Good luck and Happy Splash-and-Go!

MR. POLIKARPOV. . .

(Continued from page 59)

Firing up its 730 hp Russian-built Wright Cyclone, Tinker and the I-16 (Type 6) began flying escort and fighter-interceptor duties: "I discovered that those planes had to be handled very gently. Twice, when I tried to use my usual biplane tactics, my plane promptly went into a right spin. Most of the controlling had to be done with ailerons and flippers—very little or no rudder being required, even in steep banks."

Chasing invading Junkers "back over the mountains" being the prime sport of the day, the I-16's two 7.62 mm wing

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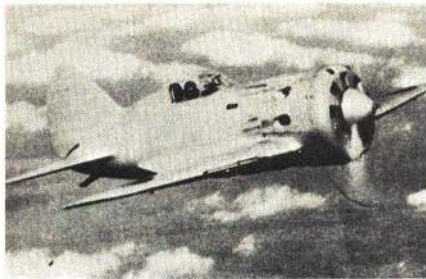
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This I-16 captured in Manchuria now sports the Japanese "meatball." (Photo courtesy of the Smithsonian Institution)

The first public display of I-16s was during Moscow's 1935 May Day demonstrations. The last known airworthy I-16 was flown in Spain until mid-1952. (Photo courtesy of National Archives)



guns spitting "1800 rounds per minute, or when both trips were pressed, 3600 rpm" made for a very comforting volume of fire.

Making as many as five sorties a day, the summer melts into flashing images. Between takeoffs and landings, Tinker survives by sizing up the enemy and his equipment. His opinion? The Italians had better airplanes, but the Germans were better pilots. Then German equipment improved.

In mid-July, "enemy planes too fast for us" buzzed the field, introducing "a new German monoplane fighter." More streamlined, it could out-dive the I-16, but Tinker found that he could out-manuever and out-climb his opponent.

A constant stream of reporting—pilot briefings, technical data and field maintenance reports, assessments of captured aircraft flowing back to the USSR—influenced changes in the I-16 as well as the other Russian equipment

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there. But, although the first of the I-16 Type 10s with their greater volume of fire power were reaching Spain, by now pilot skill was becoming more and more a necessary component to its conduct.

Following duty in Spain and China and Finland, the venerable I-16 and crafty flying were thrown into the defense of Russia. The I-16 often engaged in ramming attacks against the invaders, and in some cases, survived!

From the 1940s on, the I-16 was considered an all-around utility aircraft and trainer. Flown by men and women of the air force, today Russian pilots claim that if one could fly an I-16, one could handle *anything*.

NOTES

1. Leland Fetzer (translator), *The Soviet Air Force in World War II*, The Official History, originally published by the Ministry of Defense of the USSR (New York: Doubleday & Co. 1973).

2. John Taylor, *Combat Aircraft of the World* (England: Rainbird Publications, 1969) pp. 598-9.

3. Witold Liss, *The Polikarpov I-16* (England: Profile Publications, Ltd., 1966) Number 122.

4. Robert Jackson, *The Red Falcons* (England: Clifton Books, 1970).

5. During Jan./Feb. 1926 Franco, then a Major, and Capt. Ruiz de Alda flew one of Spain's Italian-built Dornier Wal flying boats from Palos, Spain to Buenos

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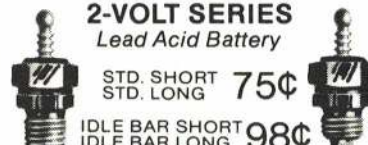


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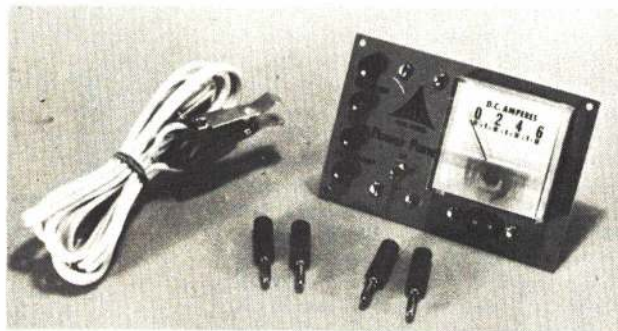
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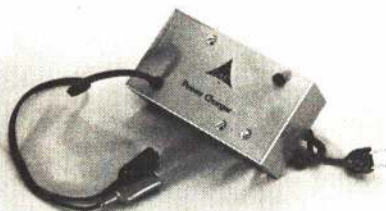


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Aires and back—a notable flight of the day.

6. F.G. Tinker, Jr., *Some Still Live* (New York: Funk & Wagnalls Co., 1938). Twenty-eight years old and a 1933 graduate of Annapolis, Tinker received flight training at Randolph Field and Pensacola.

CZECH GLIDER

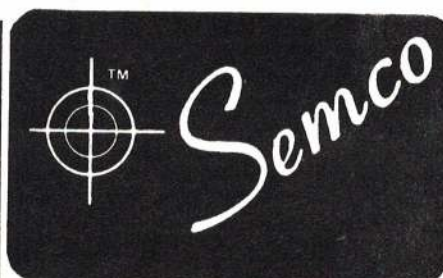
(Continued from page 76)



Variation on a simple theme. Turn the wing about-face...it flies just as well this way. The design dates back to the late 1800's.

from hard 1/8" sheet balsa. Reinforce the balsa figure with a layer of typing paper glued to each side.

In order to balance the model properly, it will be necessary to affix a weight to the pilot's feet. Feet made of lead look best, but a blob of clay will do nicely. We chose to use a ski, shaped from lead, to balance ours, as some real hang glider enthusiasts become airborne by skiing off snowy slopes. Decorate the



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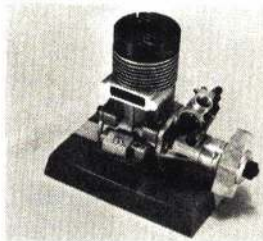
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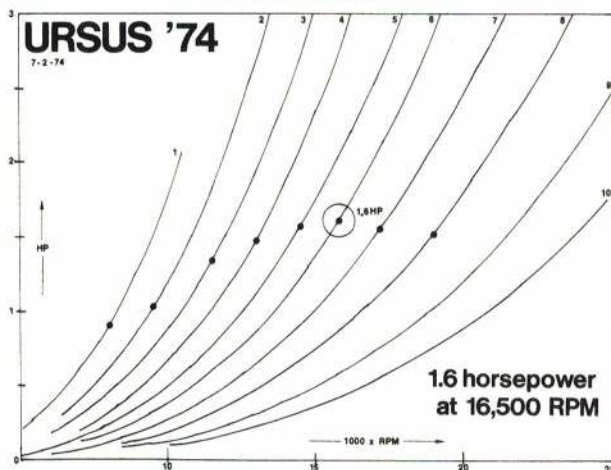
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This chart shows the remarkable horsepower generated by the URSUS '74 .60 engine. The test of horsepower vs RPM was made at the Kavan factory in Nürnberg, Germany using a Kavan Muffler, OPS glow plug and FAI fuel.

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pilot as you wish. Our model in the photographs was colored with crayons!

FLYING

Now proceed to the flying site. For flying, even a good size room will do. Since the old timers flew by the seat of their pants, so it is with our model, as that's the easiest place to hold it for launching. Adjust for level flight by balancing as shown on the plan, and then correct any stall or dive tendencies by gently bending the stabilizer trailing edges up or down, as required. Turns are dealt with by gently deflecting the trailing edge of the fin. A vigorous launch will produce two loops, something that the full-scale hang gliders have yet to attempt.

So hang in there and Czech this one out (Ugh!).

DETHERMALIZER

(Continued from page 31)

Before the landing, the glider is led into a normal glide at a sufficient altitude. Extremely hard ground contact caused by excessively high wing loading is thus avoided.

For slope flying, whole new perspectives are created by the possibility of a vertical precision landing. The often very small landing areas can be easily approached by planes in stalled flight. The zone of eddies in slope regions is hardly registered. If there is absolutely no flat area available, the craft can be landed on the slope itself, without damage. For safety, the nose of the fuselage should be turned toward the slope shortly before landing.

The dethermalizer serves the beginner primarily as an emergency brake for damage-free landings. The plane can be saved from the most unfavorable position—even in lower altitudes.

Also, the best of fliers gets his plane into critical flight situations, from which the plane can be extricated by immediate transition to stalled flight at the last second. How easily can it happen that a model does not release or gets caught in the towline? What happens when an unnoticed obstacle (post, tree, spectator, car) suddenly appears? What does one do when one must unexpectedly force the plane into an emer-

(Continued on page 107)

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1974 Nats – Something for All

Expanded Schedule Approved

A 12-day schedule of events was approved for the 1974 National Contest when the AMA officers comprising the Executive Council met on March 9 in the city where the Nats is to be held, Lake Charles, La. The detailed schedule, as approved, is reproduced on the following page.

The Indoor high-ceiling (97-ft.) events are to be flown in the Goodyear Airship Hangar at Spring, Tex., which is about 30 miles north of Houston and 140 miles west of Lake Charles. The Indoor low-ceiling (55-ft.) events are scheduled for the Lake Charles Civic Center Sports Arena, about three miles away from the site of the outdoor Free Flight, Control Line, Radio Control and Scale events—the former Chennault Air Force Base.

Approved was the lifting of previous multiple entry restrictions so that this year Control Line Navy Carrier I and II entrants may also enter Profile Carrier. Also, and this is especially important in view of the longer Nats period, rules have been changed for late Nats entry [which is an entry not mailed in advance (by July 1)]. This year late entry may be made at the contest up until 5 pm of the day before an event is scheduled to be first flown (or the day before models must be turned in for static judging, for Scale events), except RC late entries must be made no later than the last day on which transmitter processing is scheduled for a particular event.

Of course, fees for late entry are higher than for advance entry (except no increase for Junior or Senior age class entrants), so obviously there is an advantage to enter in advance by mail. Entry forms, with full information, are available upon request to AMA HQ; include a pre-addressed, stamped (10¢) envelope.

Another change approved by the council was substitution of Class D (FAI) for Class C as the uppermost RC Pattern competition. This will tie in well with

selection during 1974 of the 1975 U.S. RC Aerobatic World Championships team; Nats results will be used to determine some of the entrants in the team finals.

D Pattern qualifying on the 12th and 13th will be with a shortened maneuver schedule: (1) Takeoff, upwind; (2) Figure M, upwind; (3) Slow Roll, downwind; (4) Running 8, upwind; (5) 8-Point Roll, downwind; (6) Top Hat, upwind; (7) Roll-

ing 8, downwind; (8) Landing, upwind. The top 20 Class D contestants, based on their two best qualifying flights, will be eligible to compete in the D Pattern finals on the 14th and 15th using the full Class D maneuver schedule.

All of the events shown in the official schedule will be on the Nats entry form, and trophies to winners of these events will be awarded by AMA, but those events



Above. High ceiling Indoor events will take place on the first two days of the Nats in the Goodyear Airship Hangar, shown. Right. Photo during the January Nats press conference shows (L-R) John Embry, John Clemens, Fred Henrich, Larry Bolich, John Worth and Dennis Hinch, Jr. Embry, Henrich and Hinch (whose P-38 is shown) are members of the LARKS Club. Bolich is Lake Charles PR director. Clemens and Worth, respectively, are AMA president and executive director.





identified in the rule book as provisional or supplemental will not count for championship scoring. Other events will be run in conjunction with the Nats but outside the basic organizational structure; and so will not appear on the entry form; likely in this category will be Indoor Penny Plane, Indoor Peanut Scale, Indoor Navy Scale, FF

CO₂ Duration, FF Electric Power Duration, FF Rubber Speed, FF "D" Gas, FF Rubber Helicopter Duration, FF R.O.W. Duration, RC Helicopter, and CL Cox BF-109E Ready-to-Fly Stunt; there may be more added later.

The 1974 National Contest at Chennault Airport, Lake Charles, La., has

probably the best-ever field size and facilities for a National Contest. It has been expanded to take in many more events and activities than has been possible ever before. All hands are endeavoring to produce the best Nats in AMA history. Be a part: send for the National Contest entry form, then enter.

OFFICIAL SCHEDULE, 1974 NATIONAL CONTEST

Except as Noted, Events Are from 8 am to 5 pm

	Sunday Aug. 4	Monday Aug. 5	Tuesday Aug. 6	Wednesday Aug. 7	Thursday Aug. 8	Friday Aug. 9	Saturday Aug. 10	Sunday Aug. 11	Monday Aug. 12	Tuesday Aug. 13	Wednesday Aug. 14	Thursday Aug. 15
Free Flight	INDOOR HIGH CEILING		INDOOR LOW CEILING		OUTDOOR							
	9 am—5 pm: HL Glider	9 am—9 pm: Stick Paper Stick Cabin FAI Stick	9 am—9 pm: Stick Paper Stick Cabin FAI Stick Easy B*	9 am—3 pm: HL Glider OUTDOOR A-2 Towline B Gas Payload*	1/2A Gas Wakefield Rubber A-1 Towline	Unlimited Rubber FAI Power Helicopter CL III*	C Gas HL Glider Coupe d'Hiver Cargo*	A Gas Rocket Power				
Control Line				Combat—Sr. 1/2A Prof. Proto—Jr. 1/2A Proto Dive Bomb & Strafing* Rat R.—Op.	Combat—Jr. 1/2A Speed Stunt—Sr. Scale Racing —Op. Carrier— I & II	FAI Combat C Speed Jet Speed Stunt—Jr. FAI Team R. Mouse Race CL II* Profile Carrier	Combat—Op. B Speed B Proto Form. "40" Speed* Stunt—Op. Rat Race— Jr. & Sr.	Combat—Op. Finals A Speed FAI Speed Stunt—Op. Sc. Racing— Jr. & Sr.	Slow Combat* J. Walker Stunt Fly- off ⁴			
Radio Control Flight			Q.M. Pylon* ¹ Soaring ^{2*}	Q.M. Pylon* ¹ Soaring ^{2*}	Pylon FAI ¹ Pylon I ²	Pylon FAI ¹ Pylon I ²	Pylon I ⁵		D Pattern Qualifying ⁵	D Pattern Qualifying ⁵	D Pat. Finals ¹ A & B Pat. ²	D Pat. Finals ¹ A & B Pat. ²
Transmitter Processing		5 pm—9 pm: Q.M. & Soar- ing	6 pm—9 pm: FAI & Form. I Pylon				6 pm—9 pm: Sport Scale A, B, D Pat. AMA Scale	6 pm—9 pm: A, B, D Pat. AMA Scale		6-7 pm at flying site: A & B Pat.		
Scale Flight				3 pm—9 pm: Indoor AMA (low ceil- ing)		Outdoor Peanut* ¹	CL AMA ⁷ FF Gas ⁶ FF Rubber ⁶	RC Sport* CL Sport*			RC AMA ¹	RC AMA ¹
Turn-in Deadlines (models)				11 am: Indoor AMA ³ 5 pm: Peanut CL AMA FF Gas FF Rubber	9 am: RC Sport CL Sport			9 am: RC AMA				
Late Entry or add Events		8 am—noon 1 pm—5 pm 7 pm—9 pm	8 am—noon 1 pm—5 pm	8 am—noon 1 pm—5 pm	8 am—noon 1 pm—5 pm	8 am—noon 1 pm—5 pm	8 am—noon 1 pm—5 pm	8 am—noon 1 pm—5 pm	8 am—noon 1 pm—5 pm	8 am—noon 1 pm—5 pm		
Indoor: Late Entry, Add Events & Awards³	9 am—noon 1 pm—5 pm Awards at 5 pm	9 am—noon 1 pm—5 pm Awards at 9 pm	At outdoor site; same schedule	At outdoor site; same schedule								

Notes: *Provisional or Supplemental; ¹8 am—1 pm; ²1 pm—6 pm; ³At Indoor site; ⁴May be flown on Aug. 11; ⁵8 am—6 pm; ⁶8 am—noon; ⁷1 pm—5 pm

AMA Officer Nomination Time

The AMA Nominating Committee plans to meet during the 1974 National Contest at Lake Charles, La. Between now and when the committee meets in early August is the time for submitting names of candidate nominations for vacancies to be caused by expiring terms at the end of 1974. Such vacancies will be filled by an election later this year, the victors to be in office during 1975-76.

Up for nomination this year is the national position of AMA President and regional Vice-President positions for Dis-

tricts II, IV, VI, VIII and X. See the AMA officer directory in the May "AMA News" section (page 113) for a map of AMA districts and also a listing of current AMA officers.

Those officers to be elected comprise about half of the Executive Council, AMA's "board of directors." This is the body which establishes AMA policies and, in general, controls the destiny of AMA; thus it is extremely important for the very best people to be chosen—beginning with nomination.

Nomination Procedure. As per guidelines currently in effect, it is required that any candidate for national office (president or secretary-treasurer) must have served, or shall be currently serving, as either: elected officers of the AMA (such as vice-president) or as officers appointed by the president or the vice-presidents (such as Contest Board members, associate vice-presidents, or committee chairmen). Also, it is required that a candidate be a Leader member (or Contest Director) of the
(continued on opposite page)



Up With Newsletters!

PRESIDENT'S MEMO

Didja ever stop to think that without **communications** the Academy of Model Aeronautics would be just a local club? Our multitude of communicative **newsletters** back and forth are the magic catalyst that have brought vast expansion and healthy growth to the sport of miniature aviation. There are newsletters from a club to its members, newsletters exchanged from club to club, newsletters to AMA HQ, and AMA's newsletters (the *Monthly Mailing* and *Competition Newsletter*) to the clubs, AMA leaders, publications, and all interested parties.

If there is any one thing that will enable us to continue lifting ourselves by our bootstraps, it is communication, and the **newsletter** is a most potent tool. A newsletter is the most "instant" form of talking to one another. It has the shortest time lag in getting the information in the hands of the receiver.

The only modelers who do not often benefit from newsletters are the "loners," those who don't live close to other modelers or communities where there are established clubs. Homer Smith, who is the AMA District XI vice-president, mentioned at the AMA Executive Council meeting that there are a great number of these "loners" around the country, especially in his district in the far Northwest. He is, as are the rest of us, concerned about seeing that the "loner" somehow gets closer to our information pipelines. We don't have the answers to this problem, but would certainly be pleased to hear from any AMA'ers as to how we can bring the isolated member closer to us. I do have one suggestion which you will find farther along.

Beyond just passing the news around, the newsletters make a very interesting study. They are an excellent vehicle through which the club editors and club officers can express their club's pride and

personality as well as their own creativeness. It is a way for the club to either boast or beg. The group's accomplishments can be displayed proudly in a newsletter. Or a club's needs can be exposed to others who might be able to help.

The makeup of the various newsletters runs through a variety that is hard to believe until you get to see them all as I do. They run from simple single-page "meeting notices" to "almost-books" with many pages and sometimes in actual book form. They are reproduced in every possible way from the simplest form of hectograph and mimeograph to letterpress printing, often in several colors. All of the newsletters

provide notices of upcoming meetings. Some also contain minutes or a narration of the previous meeting. Many list the week-by-week or even day-by-day activities of the club and its individual members. Newsletters are used by all to promote upcoming contests, fly-ins, or perhaps a banquet. Some list all of the upcoming contests in their area, including those sponsored by other groups. Many of the newsletters include messages from club leaders such as the president, secretary, treasurer, activity "bosses," technical experts, and members in general. And one of the most pleasing things to see is the great number of items reproduced **from other newsletters**. This means we are "talking to each other!"

(continued on page AMA 6)



AMA President John Clemens, left, with Les Hard of Lansing, Mich., "a modeling old timer and very dedicated fellow," in Clemens' words. As editor of *The Bee Line*, Hard produces a professional-looking newsletter for the CARDS RC Club. At the Toledo RC Conference in February, Hard presented Clemens with an original portrait he had executed and published.

AMA. For elected district officers (vice-presidents) the same requirements are applicable, or either of two others may be substituted: Leader members recommended by vote of an AMA chartered club, or by a current Contest Director.

Names of all qualified candidates must be submitted in writing prior to the start of the Nominating Committee meeting. (These procedures must also be followed for re-nomination of current officers, if desired, as their names are not automati-

cally placed on the ballot.) All such names will be considered by the committee, but only two names per office will be approved by the committee for listing on the ballot. However, the ballot will provide for write-in votes for any additional candidates who meet the requirements. Candidates are also urged to submit to the committee, in advance, any statements, documents or evidence supporting their nomination. Note: the Nominating Committee is made up of the elected district vice-presidents or their designated representatives.

Nominations may be submitted by any AMA member, in writing with a statement of at least 100 words concerning the candidate's qualifications, to the member's district vice-president, with a copy to AMA HQ. Consent of the person named should be obtained prior to submission.

This announcement is published at least 90 days prior to the annual Nominating Committee Meeting in accordance with the Nominating Procedures Document provided for by the AMA by-laws.

NEWS

bits

1974-75 Rule Book

The 1974-75 rule books were mailed during the third week of March to 40,869 members whose 1974 AMA applications had been received by March 6. By now all these members should have their new rule books; if not, please notify AMA HQ so that another may be sent. The new book follows the format used previously: wherever a small dot appears next to a section or paragraph, some change from the earlier (1973) book has been made. This is an aid in getting to know the new rules without the necessity of reading *all* the fine print.

RC Pattern/Scale Advancement Form

The new Classification Advancement Record Form, for use in all classes of RC Pattern and RC Scale in accordance with new rules established during 1973, is now available. Those who receive the AMA *Competition Newsletter* found two such forms included in the March issue. A small supply of the wallet-size forms have also been sent to Contest Directors of AMA sanctioned meets having these events, but it is advisable to obtain your own cards through AMA HQ which will supply them upon request when a self-addressed stamped envelope (10¢) is included.

Design-a-Trophy

Are there artists/designers among our readers? We're inviting all such talented people to exercise their creativity and lend AMA a hand.

Some modelers feel that the National Contest trophies don't measure up to appropriate standards. The AMA HQ staff members who purchase the trophies are inclined to agree, but find improvement difficult within the budgeted funds (about \$3,000 for over 600 trophies, or about \$5 each, without engraving). Five dollars doesn't go far toward buying a stock trophy these days, but cost isn't the entire problem—design is a major factor.

Ideally, AMA would like to award trophies that look more prestigious, but that are not [much] more expensive. This is the reason AMA is looking for design ideas from talented AMA members, hoping that new trophies representative of the importance of the Nats may be obtained.

If you have an idea for a better trophy that doesn't involve excessive production costs, please put it on paper and send it to AMA HQ. But do it soon so that consideration may be given your design for 1974 or 1975 use.

Grand Prix

The Fort Worth Thunderbirds are conducting a "1974 Grand Prix," an unusual 10-month (Jan.-Oct.) project through which the "Thunderbird of the Year" will be chosen. The purpose is to recognize individual effort for the club's welfare and growth in all areas, flying and non-flying.

Points are earned for every 'contribution' (e.g., came to meeting=5, crashed the plane=2, first solo flight=15); members keep track of their activities, and total points are entered on a chart each month. Working at the '74 Nats gains the highest score, 25 points, if the Thunderbird member also wears the club emblem. And Richard Barr (AMA 67999) who reported this activity as editor of the club's newsletter, *Pilot's Log*, is supposed to receive some points (we're not sure whether three or 10) for this mention.

The "Thunderbird of the Year" will be selected by club vote on the top 10 point earners, thereby introducing 'cordiality and friendliness' as a factor. Awards and prizes will be given the top 10, with extras for the "Supergoodguy"—including his name on a perpetual trophy.



Above. Sideline shot taken during the N.Y. State Fun Fly Championships last year, showing the group from Sayre, Pa. Submitted by Richard Lape. Below. CL Rat Race winners at the King Orange Internationals. Rear: J. Kilsdonk, A. Chambers, J. Ballard. Front: S. Simpson, P. Flinn, N. Sparks, B. Keller.



Fitting award—a live turtle for the slowest time in the Flightmasters Rubber Speed Meet. The honor went to Walt Mooney and his profile French R.E.P. Racer. Bill Hannan photo.

Rudder-Only Pioneer Dies

Harrison Morgan, an early pioneer in RC modeling and rudder-only champion, died recently from injuries suffered in an auto accident.

An electrical engineer for Northeast Electronics in Concord, N.H., Harrison was also a certified watchmaker and jeweler. He was an active member of the Concord Aeroguidance Society as well as numerous other organizations including the American Watch Makers Institute, National Assn. of Watch and Clock Collectors, the Capital Mineral Club and the Masons. He was also a certified amateur radio operator, and served with the Air Force in World War II. He is survived by his wife, Mary Stockford Morgan of Pembroke, N.H., and two sons and two daughters. Model aviation will miss his worthy contributions.



Above. Dave and Charlene Ernst prep K&B 40-powered Witch Doctor. Below. Sleek FAI formula Night Train by Duke Horn uses ST 15 power. Both photos by Jerry D. Farr.





Above. The AMA chartered Kinston-Greenville Aeromodelers held a free clinic to help youngsters learn to fly their Christmas presents. Charles Buchanan's photo shows his Aero-master atop a car displaying an announcement of the project.

Below. Raymond Leone's modified Jr. Flite Streak powered by an Enya .15 is held by Melody McCrimmon. He found this model good for Stunt after converting the tank to a uniflow vent system. Photo by Steve Glynn.



PAMPA on the Move

The Precision Aerobatics Model Pilots Association (PAMPA) is rapidly assuming a position of leadership and responsibility, witness its offer to staff the CL Stunt events of the 1974 Nationals. PAMPA's monthly *Stunt News*, in a report to the membership, also said that PAMPA President Keith Trostle (AMA 35337) has conditionally agreed to assume the job of event director, and many stunts have already volunteered to fill the various positions needed to run the Stunt circles.

PAMPA is also sponsoring the restoration of the famous Jim Walker Trophy which has been awarded annually at the Nats for many years. Al Rabe (AMA 1117), current holder of the Walker Trophy, is in charge of the negotiation, and he reports that the cost is expected to be in the neighborhood of \$250. Any donations to the restoration fund will be happily accepted and noted, *Stunt News* editor Wynn Paul (AMA 3435) said. (Send to Al Rabe, 1904 Valley Oaks, Irving, Tex. 75060.)

Another interesting project that PAMPA is considering is the voluntary establishment of a Masters division within the organization in order to help solve the problems of newcomers trying to break into competition flying, and the discouragement confronting them when they

compete against the "pros." The idea as expressed by PAMPA President Trostle goes like this. At a contest with no separate division for masters, each master flyer would advise the contest management of his position; should he place for a trophy, he would relinquish it to the next non-master. Through PAMPA each master would receive a plaque indicating the masters rating, with spaces for engraved plates that show places won at contests. The contestant would have a form for the contest management to sign that he would forward to PAMPA which would, in turn, supply the plate. At present Trostle indicates that costs seem prohibitive, but he hopes that a plan can be worked out.

CL Stunt flyers interested in joining PAMPA should send a \$5 check or money order (payable to PAMPA) to Wynn Paul, 1640 Maywick Dr., Lexington, Ky. 40504.

Win a Scholarship

Hats off to the Boeing Management Association which will hold the Fifth Annual Model Aeronautics Scholarship Contest July 13 and 14 at the Boeing Space Center, Kent, Washington. The primary objective of this competition is to stimulate interest in the aeronautical field by rewarding excellence in designing, constructing, and flying model airplanes and rockets. The contest, open to anyone under 18 years old, will have 18 diversified events in Free Flight, Control Line and model rocket categories, offering \$1,750 in three scholarships. In addition, trophies will be awarded first through third places in each event. Besides the scholarship competition, separate open events are planned for the 14th, plus other fun events on both days. Jim Thompson, BMA general chairman for the contest commented that the activity should provide "an excellent weekend of entertainment for the whole family."

For further information contact: The Boeing Management Association, P.O. Box 3707, Seattle, Wash., 98124, Attn: Ted Caputo, Orgn. 4-1830, Mail Stop 79-65.



Dick Franco's Fleet Biplane (from *MAN* plans) isn't on fire! That's cleaner he's dispensing. Franco is past president of the SACRATS Club. Gil Horstman photo.



"The interest Don had in life kept Don living long after the experts said no."

Don Dulle was an active member of the Mid-Missouri RC Assn., editor of *Flypaper* and secretary-treasurer, and a past vice-president. He also owned and operated Transistor Specialties, fixed RC sets, sold hobby supplies, etc. The club and model aviation lost a good friend when he died in November. George Albright, now editor of *Flypaper* wrote:

"This man sat in a wheelchair all of his life as a victim of muscular dystrophy, but he enjoyed and pursued model aviation...."

"This man was an inspiration to all who knew him. He never won a major contest although he did participate. He was a tribute to our hobby."

In one of his final pieces as editor (Oct. 1973), Don expressed concern for modelers who continue to fly in the midst of approaching storms, and urged the use of common sense.

Everyone knows, he said, that to fly models with a thunderstorm fast approaching, or even in the rain, is a dangerous practice, tempting fate, where there can be no second chance. But he had seen flyers in this position often enough to cause him to emphasize the dangers. "Lightning is a discharge of static electricity between two opposing polarized masses; when the potential difference (voltage) builds to a level high enough to jump the air gap, a lightning bolt results." A flyer in an open field is an open target—then add an antenna to increase the potential... is "just one more flight" worth it? Remember too, Dulle said, "that if lightning should strike, it will generally wipe out a 15 to 20 foot circle," endangering everyone within the radius. So, when the thunderclouds start forming, pack-up.

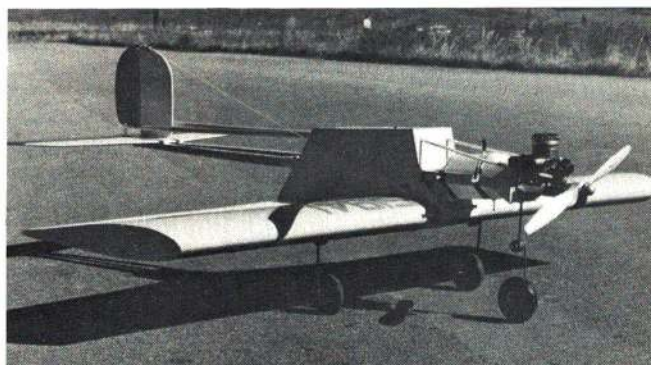
YMCA Likes Them

The Palm Beach Aeronauts club was invited once again by the North Branch YMCA in Lake Park to be a part of their annual "Family Day" activities last November. Models were displayed for the public, and several members gave an afternoon RC flying demonstration for an appreciative audience, reported Editor Fred KomLosy (AMA 79161) in their newsletter.



Left. More Rubber Speedsters in photo by Bill Hannan. That's Bill Warner who holds a Caudron in one hand and a twin pusher in the other.

Right. Unusual RC plane by Gary Paar named "Bushwhacker." Photo by Roy Stephens is from the newsletter of the Tri-Cities Aeromodelers of Tennessee.

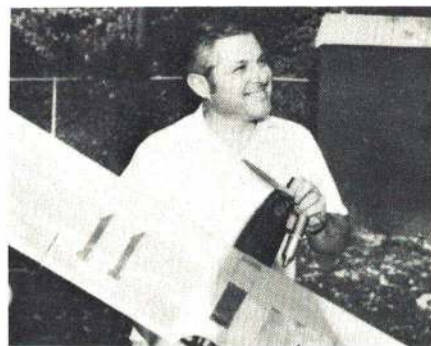


Gil Rifkin

by Jim McNeill

Shown on the right, Gil Rifkin of Nanuet, New York, proudly displaying his new AMA Life Member #11 on his favorite Radio Control plane. Modeling 33 years, he has built and flown almost every kind. Carl Goldberg's Zipper, Leon Shulman's Zomby, WW I Scale Aircraft, Phil Kraft's Ugly Stik, and old-time RC Free Flights. At present he designs, constructs, and flies RC gliders in Open competition.

He is very active in model organizations. He belongs to the New Jersey Rockland County Radio Control Club, the North Jersey RC Club, and is the Contest Coordinator for AMA's District 2.



In private life Gil is the Senior Partner of an independent New York C.P.A. firm specializing in tax consultations, manage-

ment relations, and banking liaison. He and his wife Susan have five children, David 21, Howard 19, Martin 13, Daniel 2, and Miriam 15 months. Asked his most notable achievement to date, Gil quickly answered, "Paying the bills for 5 kids."

Why did daddy become a Life Member of the Academy of Model Aeronautics? Being fond of children has influenced his thinking on modeling too. Listen to what Gil says: "Loving kids, I felt our hobby should be instrumental in preventing habits detrimental to society. By fomenting a trend in Radio Control flying, and in aiding AMA, I feel I am helping."

We are delighted to have Gil Rifkin join this exclusive class of AMA membership.

President's Memo

(continued from page AMA 3)

One of the greatest and most progressive things we find in the newsletters is much **excellent technical input**. I am always amazed at the wealth of articles showing clever ways of solving building and flying problems, and often just good old basic information and common sense. Particularly fascinating to me is seeing a good technical article appear in original form in a given newsletter, and then seeing how many other newsletters reprint it and with proper credit. That is beautiful communication—and is the very "sharing" spirit of aeromodeling.

Newsletters make a fine exchange-ground for opinion on rules, categories, safety, administrative problems, public relations, club programs, and the like. This is the very best way to let the other fellow know how you and your group are thinking. Considering this, the clubs and their editors should make sure that their mailing list for the newsletter is effective. It should certainly include their own AMA district vice-president, since he is their direct voting representative on the AMA Executive Council. If your club is inter-

ested in rules, your district Contest Board member should be receiving your newsletter. Addresses of these folks were in the May *AAAM*, page 113. And be sure that AMA HQ is on your newsletter mailing list. This one copy will be read by the AMA president, executive director, technical director and publications director. I know this because I am personally in this pipeline! If all of these people know how you feel and what you are thinking and doing, the Academy of Model Aeronautics is far more likely to be the organization you think it should be.

The swapping of newsletters with other groups is a most progressive move. Who knows but what the other club may be having more fun than your club is, or possibly they need to know how your club generates so much fun from modeling. Sure, it costs a bit to reproduce and mail a newsletter, but take my word: it is the best investment your club can make. And the larger your mailing list, the more effective is the work of your club and your **newsletter editor**. Let's talk to each other!

And now a suggestion for you "loners." If you know of a club near you (or anywhere, for that matter) that has a news-

letter, ask to be put on the mailing list. Of course, you should be willing to pay a small fee for this service. Do this and you'll come far closer to "belonging." You can find lists of AMA Chartered Clubs and their addresses in the "AMA News" sections of the March, April and May issues of *Aircraft Modeler Magazine*. These lists should be very valuable to all clubs and to the "loners," so be sure to save.

Now a **word of praise** for the most unsung but most deserving heroes in aeromodeling. The **newsletter editor** is, certainly among the very most important leaders in our happy activity. This person is usually the least thanked, often just taken for granted. Believe me, **they are giants!** Just consider that without their efforts to inform us we would be only a scattered bunch of enthusiasts enjoying just a small percentage of the true potential of fun from our chosen sport/hobby.

Blessed are the newsletters. Don't forget to thank them for their contribution to your fun.

John E. Clemens, AMA 18
AMA President



FAI RC Pylon Muffler Rule

Recent AMA announcements (April "AMA News" and December 1973 *Competition Newsletter*) concerning immediate effect of FAI's new muffler rule with linear minimum dimensions have been rescinded. This new muffler rule will not

be officially effective in AMA and FAI competitions until 1975.

The current official rule for FAI RC Pylon Racers which will be applied is that "The engine shall be fitted with an effective silencer. The use of tuned exhaust systems is prohibited. The contest director (Jury at World Championships) has discretion to disqualify any model considered excessively noisy." Thus, tuned pipes are prohibited in AMA sanctioned FAI RC Pylon Racing events during 1974, but commer-

cially available mufflers of the non-tuned-pipe variety are still acceptable as are home-builts if they meet the requirements of the rule quoted above.

This action has been approved by the AMA president as an interim measure to make AMA competition in 1974 consistent with the rules which will be applied at the International RC Pylon Contest at Lakehurst, N.J., in July, in which a number of U.S. entrants will compete.

CONTEST											
	1	2	3	4							
7	8	9								13	
14	15					18	19	20			
						24	25	26	27		
29	30	31									

CALENDAR

Official Sanctioned Contests of the Academy of Model Aeronautics

Note: For quick response and as a favor to those staging, administering and directing the contest, be certain to send a stamped, self-addressed envelope along with your request to the listed Contest Director (CD) for additional information.

May 1—Rockford, Ill. Rock Valley RC Flyers 2nd Annual Indoor Static Display. Site: Rockford. F. Vidmar CD. 4705 Highcrest Rd., Rockford, Ill. 61107. Sponsor: Rock Valley RC Flyers.

May 3—Sacramento, Calif. (AA) 1st Northern Calif. FF Council FF Contest. Site: Waegell Field. R. Fallon CD. 2667 61st St., Sacramento, Calif. 95817. Sponsor: Capitol Condors.

May 4—Cambridge, Mass. (AA) Tech Model Aircrafters Indoor Contest. Site: MIT Dupont Gym. R. Harlan CD. 15 Happy Hollow Rd., Wayland, Mass. 01778.

May 4—Curles Neck, Va. (AA) Brainbusters Spring Free Flight Meet. Site: Curles Neck. D. Orr CD. 102 Bickfield Dr., Hampton, Va. 23366. Sponsor: Brainbusters MAC.

May 4—Cowley, Wyo. (AA) Cowley RC Meet. Site: Cowley. W. Higgins CD. 305 S. Day, Powell, Wyo. 82435. Sponsor: Wyoming Sagebrush Hoppers.

May 4—Houston, Tex. (AA) Houston Modelers Association CL Meet. Site: Melrose Park. W. Lee CD. 3522 Tamarisk Ln., Missouri City, Tex. 77459. Sponsor: Houston Aero Modelers.

May 4—Zillah, Wash. (A) Valley Aero Modelers RC Fun Fly. Site: Ben's Airstrip. B. Tucker CD. Box 167, Zillah, Wash. 98953. Sponsor: Valley Aeromodelers.

May 4—Monroe, N.C. (AA) MR/CC RC Air Races. Site: Monroe RC Club. B. Helms CD. 800 Tyvola Rd., Charlotte, N.C. 28210. Sponsor: Monroe RC Club.

May 4—Huntsville, Ala. (AA) 14th Annual RC Contest. Site: Huntsville. F. Deis, Jr. CD. 7409 Attwood Dr., Huntsville, Ala. 35802. Sponsor: Rocket City Radio Controllers.

May 4—Waco, Tex. (AA) The 3rd Texas Open RC Meet. Site: Speegleville Park. M. Blose CD. Box 544, Hamilton, TX 76531. Sponsor: H.O.T.M.A.C.

May 4—Burlington, N.C. (AA) 5th Annual Central Carolina RC Meet. Site: Burlington. R. Earp CD. 2836 Wagner Dr., Burlington, N.C. 27215. Sponsor: B.A.R.K.

May 5—Wyckoff, N.J. (A) N.J.R.C.C. Spring RC Warmup. Site: Wyckoff. J. Beshar CD. 198 Merritt Dr., Oradell, N.J. 07649. Sponsor: N.J.R.C.C.

May 5—Sacramento, Calif. (AA) Northern Calif. FF Council FF Meet. Site: Sacramento. S. Geraghty CD. 2858 Pinecrest Ct., San Jose, Calif. 95121. Sponsor: Oakland Cloud Dusters.

May 5—St. Louis, Mo. Signal Chasers Fly for Fun. Site: Buder Park. M. Hart CD. 936 Donatos Dr., St. Louis, Mo. 63131. Sponsor: Signal Chasers RC Club.

May 5—Frankton, Ind. (A) 6th Annual Madison County Fun Fly. Site: Frankton Club Field. J. Payton CD. 601 W. Washington, Alexandria, Ind. 46001. Sponsor: Madison County RC Flyers.

May 5—Westport, Conn. Country Squires Spring RC Fun Fly. Site: Sherwood Island State Park. K. Bergquist CD. 45 Lakeside Dr., Fairfield, Conn. 06430. Sponsor: Country Squire Modelers, Inc.

May 5—Wichita, Kans. (AAA) 7th Annual Spring FF (Cat II) & CL Rally. Site: 13rd & Webb. M. Tallman CD. 3014 Exchange, Wichita, Kans. 67217. Sponsor: Whitchiawks.

May 5—Hadley, Mass. (A) Goodyear Pylon & FAI Grand Prix RC races. Site: Hampshire County RC's Field. J. Papageorge CD. 104 Rocky Hill Rd., Hadley, Mass. 01035. Sponsor: Hampshire County Radio Controllers.

May 5—Washington, D.C. (AA) S.L.O.W. CL Stunt & Carrier Meet. Site: Anacostia NAS. R. Greene CD. 1212 Highwood Rd., Rockville, Md. 20851. Sponsor: Sky Lancers of Washington.

May 5—Wilmington, Del. (A) Delaware RC E.C.S.S. Glider Meet. Site: Brandywine State Park. G. Geissinger CD. 1033 First Ave., Media, Penna. 19063. Sponsor: Delaware RC, Inc.

May 5—Rockford, Ill. (B) L.L.A.K.-F.V.M.A.A. CL Meet. Site: Riverdale Park. W. Morrison CD. 5N307 Hansen Rd., St. Charles, Ill. 60174. Sponsor: Lily Lake Air Knockers.

May 11—Marietta, Ga. (A) Cobb County RC 1/4 Midget Rally. Site: Cobb County Prison Farm. G. Jacobson CD. 2205 Britley Terr., College Park, Ga. 30349. Sponsor: Cobb County RC Club.

May 11—12—Oklahoma City, Okla. (AA) TORKS Spring RC Aerobatic Extravaganza. Site: Harter Park. A.S. Coffman CD. 12000 Ecker Dr., Rt. 3, Edmond, Okla. 73034.

May 11—12—Dallas, Tex. (A) Dallas League of Silent Flight 2nd Annual RC Sailplane Contest. Site: Mesquite Field. F. Combs CD. 314 Cliff Dr., Garland, Tex. 75042. Sponsor: Dallas League of Silent Flight.

May 12—Elsinore, Calif. (A) SCAMPS 020 Rubber Meet. Site: Elsinore, Calif. B. Oslan CD. 7142 Bluesails Dr., Huntington Beach, Calif. 92647. Sponsor: SCAMPS.

May 12—Chicago, Ill. (A) C.P.C. & S.A.C. RC Pylon Race. Site: SAC Field. A. Zinkel CD. 406 Strieth Ln., Glenwood, Ill. 60425. Sponsor: Chicago Pylon Club.

May 12—Palos Park, Ill. (A) 1st Annual RC Sport Scale Fly-In. Site: 107th St. & Rt. 45. B. Johnson CD. 1004 61st St., Downers Grove, Ill. 60515. Sponsor: Palos Park Radio Control Club.

May 12—Fresno, Calif. (A) FGMAC Monthly FF (Cat II) Meet. Site: Fresno. F. Ginder, Jr. CD. 5740 E. Ashlan, Fresno, Calif. 93727.

May 15—Jamaica, N.Y. (B) N.Y.C. Board of Education FF & CL Fly In. Site: August Martin High School. H. Kelem CD. 3405 Ocean Ave., Oceanside, N.Y. 11572.

May 15—Valley Park, Mo. (AA) Gateway Outdoor Free Flight Championships. Site: Buder Park. B. Gill CD. 216 Stutely Ln., Springfield, Ill. 62704.

May 18—Elmira, N.Y. (A) RC Fun Fly Harris Hill. Site: Harris Hill. E. Heyworth CD. 1210 Wolcott Dr., Horsehead, N.Y. 14545. Sponsor: Harris Hill Lift Over Drag.

May 18—Omaha, Neb. (A) M.A.S.S. Monthly RC Soaring Meet. Site: The Grass Pad. J. Simpson CD. 2636 Forbes, Omaha, Neb. 68123.

May 18—19—Bowie, Md. (AAA) Maryland State RC Aerobatic Championships. Site: Bowie Airpark. Pat Murphy CD. 11102 Tenbury, Upper Marlboro, Md. 20870. Sponsor: Prince Georges RC Club.

May 18—19—Wichita, Kans. (AA) Spring RC Pylon Meet. Site: 13th & Webb Rds. R. Smith CD. 1510 Haskell, Wichita, Kans. 67213. Sponsor: Wichita RC Club.

May 18—19—Amarillo, Tex. ARKS Spring Fly-In. Site: Amarillo. J. Franklin CD. 2700 John Dr., Amarillo, Tex. 79110. Sponsor: Amarillo RK Society.

May 18—19—Sumter, S.C. Iris RC Festival. Site: Club Flying Site. James Rampey CD. 1120 Briarbrend, Sumter, S.C. 29150. Sponsor: Sumter M.A.C.

May 18—19—Tulsa, Okla. (AA) Tulsa Glue Dobbers Spring FF (Cat II) & CL Rally. Site: 41st & 145th St., E. R. J. Dunham CD. 4730 S. Yorktown, Tulsa, Okla. 74105. Sponsor: Tulsa Glue Dobbers.

May 18—19—Harvey, Ill. (AAA) 12th Annual Season RC Opener. Site: Kickapoo Woods. W. Hargreaves CD. 14703 Lincoln, Dolton, Ill. 60419. Sponsor: Radio Control Club of Chicago.

May 18—19—Lafayette, La. (AA) 6th Annual Model Aviation Day RC Meet. Site: Lafayette. B. Fehliman CD. 421 Marilyn Dr., Lafayette, La. 70501. Sponsor: Acadian RC Club.

May 18—19—Somers, N.Y. (A) Eastern RC Air Races. Site: Somers. P. Brandt CD. 25 Griffin Ave., Bedford Hills, N.Y. 10507.

May 18—19—Jacksonville, Fla. (AAA) FF & CL Rebel Rally 1974. Site: Whitehouse NAAS. H. Pierce, Jr. CD. 3610 River Hall Dr., Jacksonville, Fla. 32217. Sponsor: RC Club of Jacksonville.

May 18—19—Rough, Ky. (AA) Kentucky's 2nd Annual RC "Mint Julep Meet." Site: Rough River State Resort Park. D. Early CD. 4505 Crator Dr., Louisville, Ky. 40229.

May 19—Cleveland, Ohio (B) 2nd Annual CL Tegel Invitational. Site: Cleveland City Field. R. Tegel CD. 425 E. 329th, Kirtland, Ohio 44095. Sponsor: Prop Busters M.A.C.

May 19—Baltimore, Md. (AA) 8th Annual CL Combat Meet. Site: Skyview Park. L. Lauer CD. 831 Lannerton Rd., Baltimore, Md. 21220. Sponsor: Baltimore Flite Streaks.

May 19—Orlando, Fla. Orlando RC Meet. Site: RCAF Field. W. Williamson CD. 8300 NW 38th St., Coral Springs, Fla. 33065. Sponsor: RC Association of Central Florida.

May 19—Winter Park, Fla. (A) RC Sailplane Championships. Site: R.C.A.C.F. Field. C. Smith CD. 106 Hilcrest St., Altamonte Spgs., Fla. 32707.

May 19—Lake Jacomo, Mo. KCRS Spring Fun Fly Meet. Site: Lake Jacomo. R. Jennings CD. 7400 E. 85th Terr., Kansas City, Mo. 64138. Sponsor: Kansas City RC Association.

May 19—Springfield, Mo. (A) Balsa Busters CL May Contest. Site: Meadow Park. B. Pfeifer CD. Rt. 2, Box 176-A, Rogersville, Mo. 65742. Sponsor: Springfield Balsa Busters.

May 19—Lombard, Ill. (AAA) 8th Annual CL Regional Championships. Site: Yorktown Shopping Center. J. Tulach CD. 2247 Bellevue Ave., Westchester, Ill. 60153. Sponsor: Tree Town Modelaires.

May 19—Jamesburg, N.J. (A) 2nd Tri-County RC Internationals. Site: Thompson Park. A. Eck CD. 361 Main St., Spotswood, N.J. 08884. Sponsor: Tri-County RC Club.

May 19—W. Suffield, Conn. (A) Nor'East RC Air Races. Site: NCRCC Field. D. Laitinen CD. 2 Oakwood St., E. Hartford, Conn. 06108. Sponsor: Northern Conn. RC Club.

May 19—Ft. Worth, Tex. (A) Pylon RC Meet. Site: Ft. Worth. F. Cox CD. 209 Rolling Hills Dr., Aledo, Tex. 76008.

May 19—Cleveland, Ohio (B) 2nd Annual Tegel CL Invitational. Site: Cleveland City Field. R. Tegel CD. 425 E. 329th, Kirtland, Ohio 44095. Sponsor: Prop Busters M.A.C.

May 19—Tucson, Ariz. (A) Cholla Choppers MAC Spring CL Slow Fest. Site: Rodeo Park. B. Reynolds CD. Rt. 8, Box 51, Tucson, Ariz. 85710.

May 19—Elmira, N.Y. (A) Spring RC Slope Meet. Site: Harris Hill. E. Heyworth CD. 1210 Wolcott Dr., Horsehead, N.Y. 14545. Sponsor: Harris Hill Lift Over Drag.

May 19—Washington Crossing, N.J. (AA) Bucks Silent Flight FF Meet. Site: Washington Crossing. J. VanSant CD. 337 Parkway Ave., Penned, Penna. 19047. Sponsor: Flying Bucks of Levittown, Pa.

May 19—Shakopee, Minn. (A) T.C.R.C. RC Glider Contest. Site: TCRC Field. L. Lippert CD. 6292 134th St., W. Apple Valley, Minn. 55124. Sponsor: Twin City Radio Controllers.

May 19—Moweaqua, Ill. (B) Blunderbirds RC Soaring Contest. Site: Kroenleins Airport. D. Holffreter CD. P.O. Box 366, Blue Mound, Ill. 62513. Sponsor: Decatur Blunderbirds.

May 19—Chagrin Falls, Ohio (AA) 10th Annual Erie Model Aircraft Assn. Old Timer FF (Cat II) Meet. Site: Savage Road. V. Dideot CD. 4410 Lorna Ln., Erie, Penna. 16506. Sponsor: Erie Model Aircraft Assn.

May 19—Aurora, Colo. (AA) C.A.T.S. Spring CL Bash. Site: 2nd & Peoria St. J. Vido CD. 4676 Dudley St., Wheatridge, Colo. 80033. Sponsor: Colorado Air Tragedy Society.

May 19—Dallas, Tex. (A) Dallas RC Formula I RC Meet. Site: Samuels Park East. S. Fly CD. 3617 Oakbriar Ln., Bedford, Tex. 76021. Sponsor: Dallas RC Club.

May 25—Bowman, S.C. (AA) Wingbusters 2nd Annual CL Spring Meet. Site: Action Hobbies Model Airport. L. Gentry CD. 377 Scoville Rd., Orangeburg, S.C. 29115. Sponsor: Wingbusters Model Airplane Club.

May 25—26—Jackson, Miss. (AA) Magnolia RC Classic. Site: Jackson. J. Woods CD. P.O. Box 127, Scooba, Miss. 39358. Sponsor: Capitol City RC Club.

May 25—26—Eugene, Ore. (AAA) Northwest CL Regionals 1974. Site: Eugene Airfield. S. Satterlee CD. 12053 64th Ave. S., Seattle, Wash. 98178. Sponsor: Eugene Propspinners.

May 25—26—Oklahoma City, Okla. (AA) Central Oklahoma CL Championships. Site: 5300 N. Bdw. Ext. M. McGee CD. 3175 N. Portland, Apt. 102, Oklahoma City, Okla. 73112. Sponsor: Controllers Model Club.

May 25—26—Charlotte, N.C. Charlotte Aeromodelers 1/4 Midget Meet. Site: Charlotte Aeromodelers Field. D. Burton CD. 5609 Lantana Ave., Charlotte, N.C. 28212. Sponsor: Charlotte Aeromodelers.

May 25—26—Spokane, Wash. (AA) 4th Annual Memorial Day RC Glider Meet. Site: Shaw High School. R. Holzapfel CD. 1025 N. Stevens, Spokane, Wash. 99208. Sponsor: Barons Model Club.

May 25—26—Kansas City, Mo. (AAA) Royal Midwestern CL Championships. Site: Swope Park. B. Wright CD. 2818 Collin, Independence, Mo. 64052.

May 25—26—N. Little Rock, Ark. (AA) M.A.R.C.S. 3rd Annual Pattern & Standoff Scale RC Meet. Site: M.A.R.C.S. Bishop Field. J. Medley CD. 324 Belmont Dr., N. Little Rock, Ark. 72116. Sponsor: Mid-Arkansas RC Society, Inc.

May 25—26—Council Bluffs, Ia. 2nd Annual National Falcon Tournament. Site: Council Bluffs. M. Wilken CD. 136 Zenith Dr., Council Bluffs, Ia. 51501. Sponsor: Cobras RC Club.

May 25—26—Clovis, N.M. (AA) MADS Annual RC Contest. Site: MADS Field. E. Harvey CD. Star Route, Box 48, Clovis, N.M. 88101. Sponsor: Clovis M.A. Driver Soc.

May 25—26—Tullahoma, Tenn. (A) Coffee Air Foilers Thermal Soaring RC Meet. Site: Model Field. C. Tutthill CD. 101 Westwood Dr., Tullahoma, Tenn. 37388. Sponsor: Coffee Air Foilers.

May 25—26—Ft. Sil, Okla. (A) Laff's 2nd Annual RC Sailplane Classic. Site: Laff's Field Gate 4. J. Apoka CD. 6532 McGlachlin Ave., Ft. Sil, Okla. 73503. Sponsor: Lawton Area Fun Flyers.

May 25—26—Benton Harbor, Mich. (AA) Third Annual Whirlwinds RC Pattern Meet. Site: Benton Harbor. M. Klintworth CD. 1449 Main St., St. Joseph, Mich. 49085. Sponsor: Whirlwinds of SW Michigan.

May 25—27—Dahlgren, Va. (AAA) Virginia State RC Championships. Site: Dahlgren Naval Weapons Lab. P. Veatch CD. 3510 Country Hill Dr., Fairfax, Va. 22030. Sponsor: Northern Va. RC, Inc.



May 26—Downers Grove, Ill. (AAA) Memorial CL Classic. Site: Downers Grove. B. Vojslavak CD. 7819 Chestnut Ave., Downers Grove, Ill. Sponsor: Woodland Aeromodelers.

May 26—Portland, Ind. (AA) SWOFF Spring FF (Cat. II) Fly-In. Site: Portland. W. Kozak CD. 3052 Village Dr., Ft. Mitchell, Ky. 41017. Sponsor: South Western Ohio FF.

May 26—Bridgewater, Mass. (A) Spring '74 FF Meet. Site: Correctional Institution. S. Colson CD. 47 Sammet St., Everett, Mass. Sponsor: New England Wakefield Group.

May 26—Chardon, Ohio (AA) CRC 12th Annual RC Pattern Event. Site: Chardon. F. Shepley CD. 36981 S. Lakeshore Blvd., Eastlake, Ohio 44094.

May 26—Battle Creek, Mich. (AAA) 3rd Annual FF & CL Southern Michigan Open Meet. Site: Kellogg Airport. L. Shearer CD. 144 Brighen Dr., Battle Creek, Mich. 49017. Sponsor: Battle Creek Balsa Bees.

May 26—New Orleans, La. 2nd Annual RC Pelican Fun Fly. Site: University of New Orleans. A. DeVoney CD. 7136 Thornley Dr., New Orleans, La. 70126. Sponsor: Orleans East Flying Club.

May 26—Schenectady, N.Y. (AA) Empire RC State Championship. Site: Schenectady County Airport. A. Sattler CD. 29 Waldorf Pl., Schenectady, N.Y. 12307. Sponsor: Thunderbolts.

May 27—Union, N.J. (AAA) 20th Union Model Airplane CL Invitational. Site: Swanstrom Pl. W. Stauch CD. 158 Washington Ave., Elizabeth, N.J. 07202.

May 27—Fort Meade, Md. 1st Annual RC Display & Fly Contest. Site: Range #5. Fort Meade. W. Ciso CD. 575 Rita Dr., Odenton, Md. 21113. Sponsor: Fort Meade Modelers MAC.

June 1—Rochester, N.Y. (AA) 15th Annual RC NY State Championships. Site: Rochester. T. Salvemini CD. 6 Valley Ln., Avon, N.Y. 14414. Sponsor: Radio Control Club of Rochester.

June 1—Ft. Lee, Va. (AA) M.V.R.C. Spring Classic. Site: Ft. Lee Flying Site. F. Gregg CD. 12709 Richmond St., Chester, Va. 23831. Sponsor: Mid Virginia RC Club.

June 1—Shreveport, La. (AAA) 11th Annual CL Louisiana State Model Airplane Championships. Site: Hobby Park. H. Hunt CD. 9529 Pitch Pine Dr., Shreveport, La. 71108.

June 1—Baton Rouge, La. (AA) Baton Rouge RC Club 13th Annual Meet. Site: Klempfer Field. L. Boutwell CD. 1739 Oak St., Baton Rouge, La. 70815.

June 1—Lincoln, Neb. (AA) Lincoln Sky Knights 15th Annual RC Contest. Site: LSK Field. R.E. Bates CD. 3230 S. 40, Lincoln, Neb. 68506. Sponsor: Lincoln Sky Knights RC Club.

June 1—Valley Park, Mo. (AAA) GSLMA Gateway CL & RC Championships. Site: Buder Park. W. Rech CD. 10821 St. Xavier Ln., St. Ann, Mo. 63014. Sponsor: GSLMA.

June 2—Ft. Lewis, Wash. (A) Indoor Spring Opener. Site: Harts Lake Prairie. D. Dodd CD. 10848 32nd Ave., SW, Seattle, Wash. 98146. Sponsor: Boeing Charter Hawks.

June 2—Kirtland, Ohio (AA) Prop Busters CL Contest. Site: Lakeland College. R. Tegel CD. 452 E. 329th. Kirtland, Ohio. Sponsor: Prop Busters.

June 2—Pasadena, Tex. 2nd Annual Red Baron RC Fun Fly. Site: Red Baron Flying Field. W. Beckham CD. 806 Grove Ave., Deer Park, Tex. 77538. Sponsor: Gulf Coast RC Club.

June 2—Lancaster, Ohio (A) F.O.R.K.S. RC Pylon Day. Site: Lancaster. J. Slater CD. 809 Forest Rose Ave., Lancaster, Ohio 43130. Sponsor: F.O.R.K.S.

June 2—Ellinwood, Kans. (AA) 2nd Annual RC Continental. Site: Ellinwood. J. Mowrey CD. Rte. 2, Box 56, Kinsley, Kans. 67547.

June 2—Hadley, Mass. (A) Sport Scale & Fun Fly Meet. Site: Hampshire Co. RCers Field. F. Mitchell CD. 290 Notre Dame St., Westfield, Mass. 01085. Sponsor: Hampshire County Radio Controllers.

June 2—Spring Valley, Ill. (A) Annual IVRC RC Contest. Site: Spring Valley Airport. H. Sutherland CD. 303 Thompson, Princeton, Ill. 73975. Sponsor: Illinois Valley RC Club.

June 2—Bowie, Md. (A) DCRS Soaring RC Meet ECCS. Site: Old Bowie Airport. J. Spalding CD. 5803 Ellerbe St., Lanham, Md. 20801. Sponsor: DCRS Club.

June 2—Greenville, Ohio DCAMA RC Fun Fly Meet. Site: Weaver Station Rd. R. Johnson CD. 320 Moody Ave., Bradford, Ohio 45308. Sponsor: Darke County Aeromodelers Assn.

June 2—Bellville, Mich. (A) Class A-1/4 Midget RC Pylon Race. Site: 6630 Rawsonville Rd. W. Yeager CD. 6323 N. Wayne Rd., Westland, Mich. 48185. Sponsor: Signal Seekers RC Club.

June 2—Glastonbury, Conn. (A) Old Timer Spring FF Rally. Site: Glastonbury. G. Armstead CD. 89 Harvest Ln., Glastonbury, Conn. 06033. Sponsor: SAM-7.

June 2—Lakehurst, N.J. (A) R/V R/C Multi-Wing Championships. Site: Lakehurst NAS. A. Schroeder CD. 18 Spencer Rd., Glen Ridge, N.J. 07028. Sponsor: Rockaway Valley RC Club.

June 2—Salem, Ohio RC Short Circuits Fun Fly. Site: Quaker City Drag Strip. J. Marshall CD. RD #5, Lisbon, Ohio 44432. Sponsor: RC Short Circuits, Inc.

June 8—Kansas City, Mo. (AA) Kansas City RC Annual. Site: Kansas City. R. Jennings CD. 7400 E. 85th Terr., Kansas City, Mo. 64138. Sponsor: Kansas City RC Assn.

June 8—Midland, Tex. (AA) West Texas Regional FF, CL & RC Championships. Site: Hogan Park. B. Boyd CD. Star Rte. B, Box 10, Midland, Tex. 79701. Sponsor: Flying Chaparrals.

June 8—Nashville, Tenn. (AA) 11th Mid-South RC Championships. Site: Nashville. B. Reuther CD. 216 Vaughns Gap Rd., Nashville, Tenn. 37205. Sponsor: Middle Tennessee RC Society.

June 8—Elk Grove Village, Ill. (AA) Chicagoland Lucky 13th Annual RC Contest. Site: Elk Grove Village. C. Mueller CD. 3742 N. Nottingham Ave., Chicago, Ill. 60634. Sponsor: Chicagoland RC Modelers, Inc.

June 8—Monroe, N.C. (AA) MR/CC Air Races. Site: Monroe RC Club. B. Helms CD. 800 Tyvola Rd., Charlotte, N.C. 28210. Sponsor: Monroe RC Club.

June 8—Virginia Beach, Va. (AA) Tidewater RC Annual AA Meet. Site: Virginia Beach. J. Raynor, Jr. CD. 5529 Nashua Rd., Virginia Beach, Va. 23462. Sponsor: Tidewater RC, Inc.

June 9—Davenport, Ia. (AA) 17th Annual CL Model Meet. Site: Davenport. R. Norgard CD. 2324 W. 29th St., Davenport, Ia. 52804. Sponsor: Davenport M.A.C.

June 9—Edwardsville, Ill. East Side RC Club 3rd Annual RC Fun Fly Jamboree. Site: Edwardsville. G. Shade CD. 3017 Maryville Rd., Granite City, Ill. 62040. Sponsor: East Side RC Club.

June 9—Colorado Springs, Colo. Annual Pikes Peak Fun Fly. Site: Colorado Springs. B. Hayhurst CD. 1219 Oswego, Colorado Spgs., Colo. 80904. Sponsor: Pikes Peak RC Club.

June 9—Ohio (AA) NOFA June FF Meet. Site: Pending. L. Miller CD. 3957 W. 185th St., Cleveland, Ohio 41111. Sponsor: Northern Ohio FF Assn.

June 9—W. Suffield, Conn. (A) Nor-East RC Air Races '74. Site: NCRCC Field. G. Beaudoin, Sr. CD. 18 Sun St., Enfield, Conn. 06082. Sponsor: NCRCC.

June 9—Sioux Falls, S.D. (AA) Flying Eagles Spring CL Meet. Site: Fairground. Sioux Falls. J. Donovan CD. 1409 Thompson Dr., Sioux Falls, S.D. 57105. Sponsor: Flying Eagles Model Club, Inc.

June 9—Ellinwood, Kans. (AA) 2nd Annual CL Continental. Site: Ellinwood. J. Mowrey CD. Rte. 2, Box 56, Kinsley, Kans. 67547.

June 9—Rice Lake, Wisc. (A) Hawks 2nd Annual Spring FF (Cat. II) Contest. Site: Rice Lake. F. Kelley CD. 20 Phipps Ave., Rice Lake, Wisc. 54868. Sponsor: Hardscabble Hawks M.A.C.

June 9—Ft. Lauderdale, Fla. Ft. Lauderdale Ugly Stick Race. Site: 16001 W. St. Rd. 84. W. Williamson CD. 8300 NW 38th St., Coral Springs, Fla. 33065. Sponsor: Broward County RC Assn.

June 9—Salina, Kans. (A) SAFE Championships RC Meet. Site: Old City Airport. D. Moden CD. 410 Hart, Salina, Kans. 67401. Sponsor: Salina Accurate Flying Eagles.

June 15—Memphis, Tenn. (AA) Propbusters Summer CL Bust. Site: McKellar Park. L. Goldsmith CD. 38 Northwood Dr., E., Memphis, Tenn. 38111. Sponsor: Memphis Prop Busters M.A.C.

June 15—Omaha, Nebr. (A) M.A.S.S. Monthly RC Soaring Meet. Site: The Grass Pad. J. Simpson CD. 2636 Forbes, Omaha, Nebr. 68123.

June 15—Plymouth, Mich. (A) Detroit Dual RC Meet. Site: Plymouth. D. Corven CD. 32364 Gainsborough, Warren, Mich. 48093. Sponsor: Greater Detroit Soaring & Hiking Soc.

June 15—Mesquite, Tex. (AA) Dallas RC Club 10th Annual RC Pattern Meet. Site: Samuels Park East. D. Brown CD. 930 Vinecrest Ln., Richardson, Tex. 75080. Sponsor: Dallas RC Club.

June 15—Winston-Salem, N.C. (AAA) Southeastern CL Model Airplane Championships. Site: Coliseum Parking Lot. W. Pardue, Jr. CD. 1201 Surry Dr., Greensboro, N.C. 27408. Sponsor: Golden Triad Model Masters.

June 15—Dayton, Ohio (AA) Wright Brothers Memorial Annual RC Meet. Site: Wright Patterson AFB. D. Lowe CD. 3491 Clar Von Dr., Dayton, Ohio 45430. Sponsor: Western Ohio RK Society.

June 15—Langley A.F.B., Va. (AA) 10th Annual SEVRCC RC Championships. Site: Langley A.F.B. M. Rich CD. 35 Harris Landing Rd., Hampton, Va. 23669. Sponsor: Southeastern Va. RC Group.

June 15—Denver, Colo. (AA) 16th Annual Mile-Hi RC Meet. Site: Denver. H. Geller CD. 6920 E. Exposition, Denver, Colo. 80222. Sponsor: Mile-Hi RC Club.

June 15—Pensacola, Fla. (AA) Pensacola Aero Modelers Annual RC Meet. Site: Corry Field. R. Fritz CD. 1005 Revere Dr., Pensacola, Fla. 32505. Sponsor: Pensacola Aero Modelers.

June 15—Springfield, Mo. (AA) Spring Balsa Bust CL Meet. Site: Meador Park. B. Pfeifer CD. Rt. 2, Box 176-A, Rogersville, Mo. 65740. Sponsor: Springfield Balsa Busters.

June 15—Milwaukee, Wisc. (AA) Circlemasters of Milwaukee CL Meet. Site: Northridge Shopping Center. E. Boese CD. 3808 N. 97th Pl., Milwaukee, Wisc. 53222. Sponsor: Circlemasters of Milwaukee.

June 15—Jamestown, N.Y. (AA) United Pylon Racing Circuit RC Meet. Site: Jamestown. E. Landefeld CD. RD #2, 11151 Jamison Rd., E. Aurora, N.Y. 14052.

June 15—Nassau, N.Y. (A) Long Island Drone Society 4th Annual RC Pylon Meet. Site: Mitchell Field. W. Fuori CD. 28 Fernwood Dr., Commack, N.Y. 11725. Sponsor: Long Island Drone Society.

June 15—Chicago, Ill. (A) Sport Pattern Biplane Contest. Site: S.A.C. Field. G. Nelson CD. 23 Marie Dr., Downers Grove, Ill. 60515. Sponsor: Suburban Aero Club.

June 15—Lake Elsinore, Calif. (A) 5th Annual R.O.W. Scale FF Meet. Site: Lake Elsinore. C. Hatrak CD. 3825 W. 144th St., Hawthorne, Calif. 90250. Sponsor: Rockwell International Flightmasters.

June 15—Glastonbury, Conn. (A) SAM-7 Summer Outing. Site: Meadow Road. T. Lucas CD. 19 Burke Rd., Rockville, Conn. 06066. Sponsor: Society of Antique Modelers Chapter 7.

June 15—Plymouth, Mich. (A) SOAR Dual RC Meet. Site: Plymouth Field. N. Liptak CD. 325 O'Neil St., Joliet, Ill. 60436. Sponsor: Society of Aeromodeling by Radio.

June 15—Memphis, Tenn. (AA) Memphis CL Meet. Site: McKellar Park. L. Annratone, Jr. CD. 5072 Hampshire Ave., Memphis, Tenn. 38117. Sponsor: Memphis Society of Modeling, Inc.

June 15—Council Bluffs, Iowa (AA) 11th Annual Midwest CL Model Meet. Site: Iowa School for the Deaf. H. Hough CD. 924 Avenue I, Council Bluffs, Iowa 51501.

June 15—Canoga Park, Calif. (A) San Fernando Valley Silent Fliers Bi-Monthly RC Meet. Site: Pierce College. J. Timlin, III CD. 10539 Hillview Ave., Chatsworth, Calif. Sponsor: San Fernando Valley Silent Fliers.

June 22—Moweaqua, Ill. (A) Blunderbirds RC Thermal Soaring Contest. Site: Kroenleins Airport. D. Holtfreder CD. P.O. Box 366, Blue Mound, Ill. 62513. Sponsor: Decatur Blunderbirds.

June 22—Winter Park, Fla. (A) Great Florida Bi-Plane RC Championships. Site: R.C.A.C.F. Field. W. Schoonard CD. 2080 Sharon Dr., Winter Park, Fla. 32789.

June 22—Courtland, Ala. (AA) Decatur M.A.C. 8th Annual RC Meet. Site: Courtland Air Base. J. Ray CD. 1304 Fletcher Ave., SW, Decatur, Ala. 35601. Sponsor: Decatur M.A.C.

June 22—Columbia, Mo. (AA) Mid-Missouri RC Assn's 2nd RC Contest. Site: Columbia. G. Albright CD. 1014 Bellevue Ct., Jefferson City, Mo. 65101. Sponsor: Mid-Missouri RC Assn.

June 22—Newark, Calif. (A) RC Standoff Scale Invitational. Site: Willow Avenue. R. Franco CD. 4868 Mauna Loa Pk. Dr., Fremont, Calif. 94538. Sponsor: Southern Alameda County Radio Controllers.

June 22—Spokane, Wash. (AA) Expo '74 RC Miniature Aircraft Competition. Site: Fairchild AFB. G. Horstman CD. E11223 LaCrosse, Spokane, Wash. 99206. Sponsor: Barons Model Club.

June 22—Osseo, Minn. (AAA) 1974 10,000 Lakes CL Championships. Site: N. Hennepin Community College. J. Welliver CD. 7525 N. 59th Pl., Minneapolis, Minn. 55428.

June 22—Melbourne, Fla. (AA) Third Fingercrackers CL Championships. Site: Brevard Jai Alai. G. Ross CD. 1700 Pontiac Cir., Melbourne, Fla. 32935. Sponsor: Fingercrackers M.A.C.

June 22—Tulsa, Okla. (AA) 25th Annual Tulsa Glue Dobbers RC Meet. Site: Local Field. J. Dunn CD. 5019 S. Joplin Ave., Tulsa, Okla. 74135. Sponsor: Tulsa Glue Dobbers.

June 22—Washington, D.C. (AA) S.L.O.W. Summer 2nd Annual CL Spectacular. Site: Anacostia NAS. M. Strieter CD. 592 University Blvd., Silver Spring, Md. 20903. Sponsor: Sky Lancers of Washington.

June 22—Dahlgren, Va. (AA) DC/RC Annual Aerobatic Meet. Site: Dahlgren Naval Weapons Laboratory. T. Carey CD. 17900 Cliffbourne Ln., Derwood, Md. 20855. Sponsor: DC/RC, Inc.

June 22—Casco, Mich. (AA) 19th RC Championships. Site: RCCD Field. H. Mottin CD. 2124 Common Rd., Warren, Mich. 48092. Sponsor: RC Club of Detroit.

June 23—Benton Harbor, Mich. (A) Whirlwinds 3rd Annual RC Glider Meet. Site: Benton Harbor. R. Scher CD. Box 10, 604 John Beers Rd., Stevensville, Mich. Sponsor: Whirlwinds of Southwest Michigan.

June 23—Warrens, Ohio (AA) 1st Annual Cleveland RC Club Pattern Contest. Site: Harvard & Richmond Rds. A. Bumpus CD. 1819 Haldane, Cleveland, Ohio 44112. Sponsor: Cleveland RC Club.

June 23—Chagrin Falls, Ohio (A) 3rd Annual Great Lakes Rubber Scale Meet. Site: Savage Road. L. Reichel CD. 3301 Cindy Ln., Erie, Penn. 16506. Sponsor: Erie Model Aircraft Assn.

June 23—Cleveland, Ohio (AA) Flitemasters CL Rally. Site: Cleveland. G. Baker CD. 4023 Victory, Cleveland, Ohio 44135.

June 23—Maywood, Ill. (A) RC Pylon Race. Site: Maywood. R. Piores CD. 823 N. Lombard Ave., Oak Park, Ill. 60302. Sponsor: Checkerboard RC Club, Chicago Pylon Club.

June 23—Easton, Penna. (AA) Lehigh Valley R.C.S. RC Contest. Site: Bradens Airport. D. Noll CD. 3831 Mechanics Blvd., Allentown, Penna. 18052. Sponsor: Lehigh Valley R.C.S.

June 23—Ft. Worth, Tex. (A) Formula I RC Pylon Race. Site: Ft. Worth. E. Slaughter CD. 2202 Jacocks Ln., Ft. Worth, Tex. 76115.

June 23—Sepulveda, Calif. (A) San Valers Monthly June '74 FF (Cat. II) Meet. Site: Sepulveda. L. Sindelar CD. 5238 San Fernando Rd., A. Glendale, Calif. 91203. Sponsor: San Valers M.A.C.

June 23—Hadley, Mass. (A) Grand Prix RC Air Races. Site: Hampshire Co. RCers Field. R. Dash CD. 19 Kelleher Dr., S., Deerfield, Mass. 01373. Sponsor: Hampshire County Radio Controllers.

June 23—Moweaqua, Ill. (A) Blunderbirds RC Thermal Soaring Contest. Site: Kroenleins Airport. D. Holtfreder CD. P.O. Box 366, Blue Mound, Ill. 62513. Sponsor: Decatur Blunderbirds.

June 23—Detroit, Mich. (AA) Great Lakes International CL Meet. Site: Rouge Park. A. Adamson CD. 22454 Fairfax, Taylor, Mich. 48180. Sponsor: Strathmore Model Club of Detroit.

June 23—Henrico County, Va. Curles Neck 2nd Annual Fun Fly. Site: Curles Neck Dairy Farm. J. Novak CD. P.O. Box 539, Chester, Va. 23831. Sponsor: Curles Neck FF & Soaring Society.

June 23—Franklinville, N.J. (A) Pre-SAM Nats RC O.T. Warm-Up. Site: Franklinville. D. Lamkin CD. Box 499 Coles Mill Rd., Franklinville, N.J. 08322. Sponsor: Clayton RC Club.

June 23—Hamburg, N.Y. 1st Annual "Wrongway Corrigan" Grand Prix. Site: Hamburg. K. Landefeld CD. 11151 Jamison Rd., E. Aurora, N.Y. 14052. Sponsor: RC Racetracks, Inc.

June 23—Cody, Wyoming (AA) Cody RC Glider Meet. Site: Cody. W. Higgins CD. 305 S. Day, Powell, Wyoming 82435. Sponsor: Wyoming Sagebrush Hoppers.

June 23—Rockford, Ill. (AA) Rockford Aeromodelers Annual CL Contest. Site: Riverdahl Model Airport. A. Johnson CD. 1818 Oslo Dr., Rockford, Ill. 61108. Sponsor: Rockford Aeromodelers.

June 29—Dayton, Ohio (A) 1st Annual DARTS RC Soaring Competition #1. Site: Municipal Field. L. Gleason CD. 108 Cushing Ave., Kettering, Ohio 45429. Sponsor: Dayton Area Thermal Soarers.

June 29—Wichita, Kans. (AA) Annual Midwest RC Championships. Site: 13th & Webb Rd. J. Finley CD. 6540 E. Central, Wichita, Kans. 67208. Sponsor: Wichita RC Club.

June 29—Syracuse, N.Y. (AA) Syracuse A.R.C.S. 3rd Annual RC Pattern Meet. Site: Syracuse. W. Thorne CD. 208 Windemere Rd., Syracuse, N.Y. 13219. Sponsor: Aero Radio Club of Syracuse.

June 29—Valley Forge, Penna. (A) Third Annual Valley Forge RC Scale Classic. Site: Valley Forge State Park. N. Evans CD. 970 Steven Ln., Wayne, Penna. 19087. Sponsor: Valley Forge Signal Seekers.

June 29—Lima, Ohio (AA) LARKS 1st Annual RC Pattern & Standoff Scale Meet. Site: Bath Twp. House Rt. 81. G. Lucke CD. 970 Brice Ave., Lima, Ohio 45805. Sponsor: Lima Area Radio Kontrol Society.

June 30—Rochester, N.Y. (AA) United Pylon Racing Association Meet. Site: Rochester. R. Walder CD. 27 Folkside Ln., Fairport, N.Y. Sponsor: Radio Control Club of Rochester, Inc.

June 30—Chicago, Ill. (AA) Skylands Annual RC Meet. Site: Ned Brown Forest Preserve. D. Gauer CD. 832C Colonial, Wheeling, Ill. 60090.

June 30—Bridgewater, Conn. (AA) Summer '74 FF Meet. Site: Correctional Institution. S. Colson CD. 47 Sammet St., Everett, Mass. 02149. Sponsor: New England Wakefield Group.

June 30—Muscatine, Iowa (AA) 5th Annual CL Contest. Site: Muscatine Plaza. K. Morris CD. 404 Park Ave., Muscatine, Iowa 52761. Sponsor: Muscatine Miniature Aircraft Assn.

June 30—Warminster, Penna. (AA) D.V.F.M.A.C. FF (Cat. II) Fling. Site: Warminster Naval Air Facility. T. Kerr CD. 7824 Lexington Ave., Philadelphia, Penna. 19152. Sponsor: Philadelphia Sky Pirates.

June 30—Dayton, Ohio (A) 1st Annual DARTS RC Soaring Competition #2. Site: Municipal Field. W. Pinnell CD. 2474 Bangor Dr., Dayton, Ohio 45431. Sponsor: Dayton Area Thermal Soarers.

June 30—Fresno, Calif. (A) FGMAC Monthly FF (Cat. II) Meet. Site: Fresno. F. Ginder, Jr. CD. 5740 E. Ashlan, Fresno, Calif. 93727. Sponsor: Fresno Gas Model Club.

June 30—Muncie, Ind. (B) Season Opener for CL. Site: Westside Park. A. Goff, Jr. CD. E. 12th St., Muncie, Ind. 47302. Sponsor: Muncie Controllers.

June 30—Texas City, Tex. Texs City Summer Fun Fly. Site: Texas City. K. Remmler CD. 407 Biscayne Blvd., Seabrook, Tex. 77586. Sponsor: Texas City RC Club.

June 30—Sioux Falls, S.D. (AA) Sioux Falls RCers Fun Fly. Site: Modelport West. J. Donovan CD. 1409 Thompson Dr., Sioux Falls, S.D. 57105. Sponsor: Sioux Falls RCers.

June 30—Valkaria, Fla. (A) Valkaria RC Meet. Site: Valkaria Airport. W. Williamson CD. 8300 NW 38th St., Coral Springs, Fla. 33065. Sponsor: Indian River Kontrol Soc.

June 30—Troy, Ohio (A) Sky Bugs 1st Annual CL Combat Meet. Site: Clark Field. J. Fasimpair CD. 4045 Old Salem Rd., Englewood, Ohio 45322. Sponsor: Troy Sky Bugs.

AMA OFFICER DIRECTORY

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DETHERMALIZER

(Continued from page 98)

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TESTS/VECO 61

(Continued from page 50)

The throttle graph shows what is a normal picture for all throttled engines; the throttle gives the most even response with the largest prop (load). This particular engine reached peak rpm as soon as it broke into a clean two-cycle setting.

The engine is well made and should provide many hours of service.

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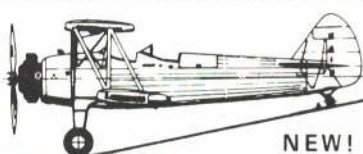
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TESTS/SUPERTIGRE 60

(Continued from page 51)

before it reaches a constant pipe diameter. The pipe continues inside to just past 75% of the length of the pipe. It has twelve holes drilled in it to help mix exhaust gases and fresh air inside the muffler shell. Then everything goes out a really large opening at the rear.

Does it muffle? My ears tell me: not a lot. Does it cost rpm? My tach reads 12,000 on a 11 x 7 1/2 prop, with and without the muffler.

I discovered it did something else: blow in the front and whistle! Since the deer, goose,

bear and boar hunting seasons are over around here, I'm going to wait till next fall before I take it out in the woods and blow through it. Sure hope it isn't a seagull call.

This engine and muffler are a happy combination that will satisfy a lot of pilots.

SPINKS AKROMASTER

(Continued from page 45)

castoring tailwheel (I like to blast around on the ground). A touch of up elevator gently lifts the plane off.

Those big wings and the throaty roar of the muffled ST 71 are impressive. Loops are effortless. Rolls are majestic, with a slight touch of down elevator in the inverted position. She really moves at full throttle with a 14-6 prop. The airplane responds well to trim commands. Once you get used to the deceptive speed of this large plane, landings are a breeze. Set up about 80 yards out and 20 yards up, cut the throttle and roll in down trim. The Akromaster is extremely stable at slow speed. Flare slightly just before touching down. If you land with appreciable speed, you will be surprised at the length of the roll out... its long.

For you hot shots with five or more channels, I suggest clipping four inches off each wing tip for a faster roll rate. Maintain the same aileron area, but add flaps or flaperons. You should also clip the tip off the tail. If you don't have a ST 71, you really ought to get one, but your 60 will do if you hold the weight down. Good flying and be careful how, and where, you fly!

TESTS/ PRO LINE RADIO

(Continued from page 51)

still is sufficiently high that the larger 550 mah (derated from 800 mah) airborne battery pack is standard.

OVERALL EVALUATION: System resolution is shown in the figure below. Receiver sensitivity, selectivity, and image rejection are excellent. The D&R sticks offer very good precision at economical cost.

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STOCKWELL ON PYLON

(Continued from page 68)

There are also several fiberglass versions of the Minnow available; the best known is the one kitted by Jim Stegall, and strongly favored by many of the Southern fliers like D.C. May and Harold Coleson. The versions of the Minnow that Jim Maki and Bill Williamson fly to so many wins down in Florida are also Stegall's product. Like the Miss DARA, the Stegall Minnows are kitted with foam



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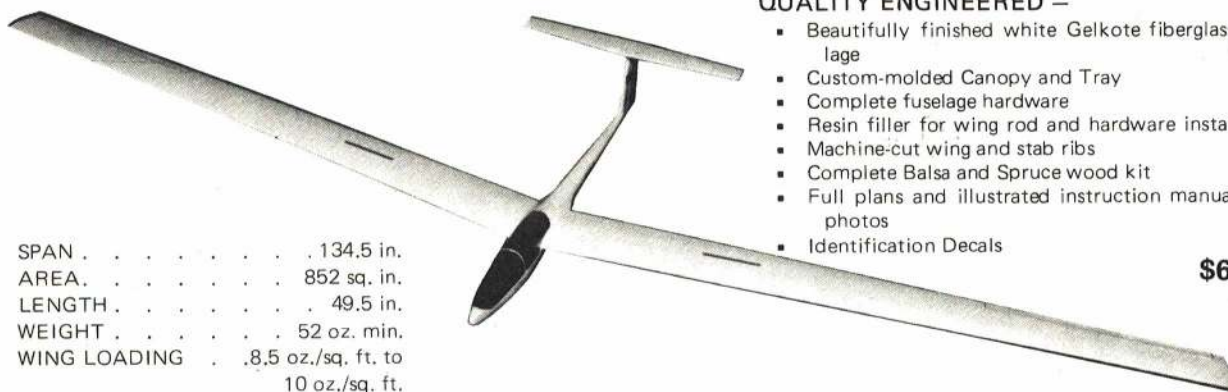
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cores that are to be sheeted with 1/64" plywood, whereas the Stafford kit is intended for 3/32" balsa sheeting.

There are other excellent low-wing planes, like the Miss Dallas and the Pits Pellet. The Dallas is kitted in balsa by J.G. Products in Southern California. The Dallas has a relative-



Jeff Bertken with his L'il Toni, one of several low-wing renditions of the Cosmic Wind. Terry Prather is kitting an epoxy/fiberglass model.

ly lower aspect ratio wing than the Minnow, but it is a nice clean ship which appears to fly well (it's one of the few we've never built). The Midget Mustang and the Shark have the virtue of excellent ground handling, with landing gear widely separated in the wing, and both can be built as clean as any. The Shark is especially easy to build light, because it has a built-up wing (in the Francis Products version, anyway).

The one question you may wonder about is how to keep your first Formula 1 airplane light enough. Pattern builders, in general, don't worry quite so much about weight. However, weight is important in Formula 1: you want it out at about 4 lb. 14 oz. The secret to getting it there is in the use of 1/2 oz. or 3/4 oz. fiberglass and coating resin. The resin sands so extremely well that you can use two or even three coats, and sand it to a perfect gloss. One coat of Superpox provides a finish of spectacular gloss and durability. Use electrical tape to put a sharp edge on your trim (lift the tape off within a few minutes after spraying).

Next month, we will look into some aspects of engine installation and building.

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(Continued from page 70)

ment and (2) span strength to withstand flexing. This is certainly not a beginner's project.

Soaring Symposium: Another first for all soaring enthusiasts will be a symposium, hosted by The Silent Order of Aeromodelling by Radio Club (SOAR), following the glider Nats. The Nats are held from July 22-24, 1974 at Lewis College, Lockport, Ill.

A symposium will be held on July 25, with Dr. Hall acting as coordinator and parliamentarian. The purpose of this symposium is the formation of a National RC Soaring Association. Any proposals for the symposium may be submitted by individuals, clubs, or any of the twelve RC Soaring Advisors.

During the symposium, opinion polls will be taken of the participants in attendance for guidance. However, the final action on any proposal submitted will ultimately be the decision of the RC Soaring Advisory Committee. The deadline for all proposal submissions is June 1, 1974. All submissions should be forwarded to Dennis Hall, 415 Glenshire Rd., Glenview, Ill. 60025. This soaring symposium is open to all interested modelers.

Over Fifty Trophies and Awards: The up-and-coming, biggest soaring event of the year will sponsor two competition age groups. Category 1 will be Junior and Senior (under 19), and Category 2 will cover Open (19 years of age and older). Thermal events have been established for three classes: Standard (wingspan of 100" or less); Unlimited, which encompasses any size wingspan, and Scale (documented). Competition tasks will be Two Minute Precision, Precision Duration (having a 15-minute cumulative time) and Ten Minute Duration. Entry fees are \$15.00 for the Open age group, \$7.00 for Jr./Sr. and \$10.00 for Scale. No charge for Team entries. For further information and pre-registration forms, send a stamped self-addressed envelope to: 1974 R/C Soaring Nationals, c/o Dan Pruss, Rt. 2, Box 49D, Plainfield, Ill. 60544. Pre-registration deadline is June 15, 1974.

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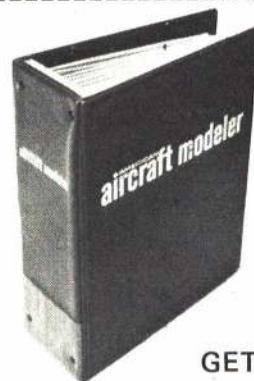
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McCULLOUGH ON RC

(Continued from page 71)

layers of paper; put on one sheet at a time. Lap the joints for strength. After drying for a day, the laps can be sanded off, or may be left to simulate overlapped metal panel joints. The covered surface comes out a little uneven—about like the appearance of the plywood sheeting on a Lockheed Vega. This can provide a realistic scale effect when desired, or be filled with a coat of brushed-on spackling compound (or patching plaster) and sanded down to get rid of the waviness.

Next, brush on a couple of coats of ordinary latex interior wall paint. Tom used K-Mart brand. White makes the best base for light colored finishes. Let dry for a day and sand smooth with 400 wet-or-dry paper. The color coat is regular model airplane dope and the decal decorations were made by the gummed-paper-and-dope method described in this column (February 1974 AAM).

Fuselages are made in similar fashion. Stark recommends this method for designs with compound curves like the Spitfire. It is light, cheap and faster than strip planking.

MARKS ON RC

(Continued from page 72)

"Assembly is simply a matter of fastening the duplex outlet and the switch to the box cover. Both parts are wired in series. Do not omit the use of a three-wire grounded line cord, as a precaution against electrical shocks. The mounting ears on the dimmer switch may have to be trimmed somewhat. This will depend on the shape of the box cover you purchase, and will be very evident when you assemble the switch to the cover.

"There may be some AM radio interference when this unit is in use, as noted on the switch instructions.

"I calibrated my control with voltage positions using a separate voltmeter, but it can also be marked with reference numbers."

POLING ON ELEC. FLIGHT

(Continued from page 72)

full-length. The sketch shows the installation of the motor and a toggle switch rigged as a trip switch. The taildragger gear is recommended, so that the trip switch can be used. The switch has saved the motor and battery several times from sudden discharges in crashes or bad launches.

The photo shows an earlier setup with a rewound slot car motor (1/24 scale), which gave flights of two to three min. at altitudes up to 200 ft.

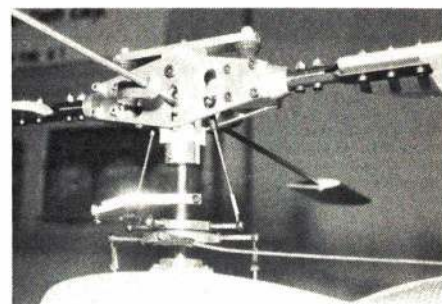
Electric Airplanes in England: Peter Russell, the columnist for "Straight and Level" in *Radio Control Models and Electronics*, first flew his STOL Mk.1 as an electric in March 1973. The Sea Pup motor was used in the original version, but this has since been replaced with the Sea Wasp-6. Both versions use a ten-cell 1.2 Ah. SAFT fast charge battery. The motors (of U.S. design and manufacture) and battery cells are available from Kroker Engineering and Development Company, P.O. Box 14056, Albuquerque, New Mexico 87111.

The Sea Pup version drove an 8-4 Top Flite nylon prop at 9000 rpm, and drew 15 amperes. Takeoff weight was 62 oz., wing area 3.6 sq. ft. The first flight was not just ROG; Peter did acrobatics, loops and rolls as well! The plane is a three-channel digital, with flight times of six min.

The Sea Wasp version has a 25% increase in power, with over 16 amperes draw, and five to six min. of flight. It does good Touch-And-Gos, and Peter flies it off his back lawn. This involves grass takeoffs in less than 100 ft., with no reference to wind direction, with total disregard to a big rockery at one end of the strip and trees lining both sides of the 30-ft. wide strip. The plans for the STOL Mk.1 are available from RCM&E Plans Service, Plan R/C 1190, for 1.25 pounds (about \$4). Peter also has a very complete description of his plane, with photos, in the *Aero Modeler Annual*, 1973-74. That's it for now. I'm out to fly my quiet revolution!

BURKAM ON HELICOPTERS

(Continued from page 72)



Detail shot of Schluter's rotor head on the Gazelle. The entire paddle bar and swashplate slide up and down for collective pitch.

Gazelle. The only kit helicopters that do have single-bolt blade attachment are the U.S. kits of Du-Bro and Keats (Polecat).

Du-Bro 505: Dave Keats, who probably knows more about the Whirlybird than Dave Gray (and more about the Superbird than Ed Sweeney), tells how to make 505s more flyable in a wind. Taper the blades from full chord at the root, to 1-7/8" chord at the tip, by trimming off the trailing edge. Then round off the tips and radius the freshly cut edge. Do not sand in an airfoil shape. This 1-7/8" figure was not a guess, but the result of many tests with wider and narrower tips in nominal winds (10-12 mph). With the tips too wide, the rotor would come up to speed and the model would tip backwards. With the tips too narrow, it fell over on its side, just before liftoff. Dave says he flies with a 10-5 Top Flite prop, as his engine will no longer lift off with a 10-6.

A four-bladed hingeless rotor is shaping up in Burkam's basement. The objective is to develop a simple stabilizing system for this rotor and see what it can do in the way of aerobatics. More on that next month.

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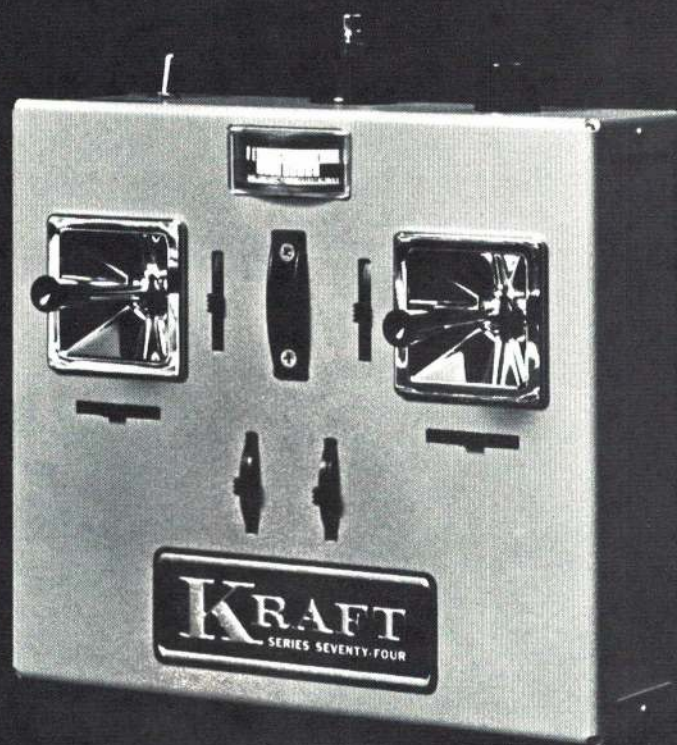
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